



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

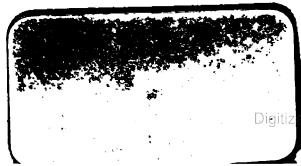
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



Pe 1519 Q. 113













# GUY'S HOSPITAL REPORTS.

EDITED BY  
SAMUEL WILKS, M.D.,  
AND  
ALFRED POLAND.

---

Third Series.

VOL. IX.



LONDON:  
JOHN CHURCHILL AND SONS, NEW BURLINGTON STREET.

---

MDCCCLXIII.

LONDON :  
PRINTED BY J. E. ADLARD, BARTHOLOMEW CLOSE.

## CONTENTS.

---

	PAGE
I. On the Syphilitic Affections of Internal Organs ; by SAMUEL WILKS, M.D. . . . .	1
II. On Pulsating and Aneurismal Tumours of the Abdomen ; by S. O. HABERSHON, M.D. . . . .	65
III. The Stereoscope, and Stereoscopic Results ; by JOSEPH TOWNE . . . . .	103
IV. The Stereoscopic Test for the Retinæ ; by JOSEPH TOWNE .	127
V. Case in which a large quantity of Nitrate of Potash was taken Medicinally. Elimination of this Salt by the Urine, with Remarks ; by Dr. WILKS and Dr. A. S. TAYLOR .	173
VI. On the Cooling of the Human Body after Death. Inferences respecting the Time of Death. Observations of Temperature made in 100 Cases ; by Dr. ALFRED S. TAYLOR and Dr. WILKS . . . . .	180
VII. On Tumours. Clinical Report ; by THOMAS BRYANT. .	212
VIII. Sebaceous Tumour within the Tympanum ; by JAMES HINTON . . . . .	264
IX. A slight Historical Survey of Foreign Bodies in the Stomach and Intestines ; by ALFRED POLAND . . . . .	269
X. Some Observations on the Iodic Acid Test for Morphia ; by Dr. DUPRÉ . . . . .	323



# LIST OF PLATES.

---

	TO FACE PAGE
<b>Dr. WILKS.</b>	
PLATE I. The face of a young woman, showing the effects of hereditary syphilis . . .	64
PLATE II. Portions of cranium, brain, spleen, and testes, showing the effects of syphilis . . .	64
PLATE III. Section of liver and lung, showing the effects of syphilis; also larynx and bronchial tube . . .	64
PLATE IV. Oesophagus, trachea, and heart, affected by syphilis . . .	64
<b>Dr. HABERSHON.</b>	
PLATE V. Two figures representing the stomach in connection with an abdominal abscess . . .	102
<b>Mr. TOWNE.</b>	
PLATE VI. Two figures showing the lines of direction on the retinæ from figures placed before them . . .	126
PLATE VII. Figures showing the effects of colours on the retinæ . . .	126
PLATE VIII. Figures illustrating the tests for the condition of the retinæ . . .	172
PLATE IX. Figures showing the alteration which figures undergo in morbid conditions of the retinæ . . .	172
PLATE X. Ditto ditto . . .	172
<b>Mr. HINTON.</b>	
PLATE XI. Two figures of the petrous bone, showing a sebaceous tumour in the tympanum . . .	268





## LIST OF SUBSCRIBERS.

---

Aberdeen Medico-Chirurgical Society, per W. Fraser, Esq., King Street,  
 Aberdeen  
 Adam Mercer, M.D., Boston, Lincolnshire  
 Adams, M. A.  
 Aikin, Charles A., 7, Clifton Place, Sussex Square, W.  
 Aikins, M. H., M.D., Toronto, Canada West  
 Alcock, Thomas, M.D., 66, Upper Brook Street, Manchester  
 Aldersey, William Hugh, Buntingford, Herts  
 Allwork, C. L., Maidstone  
 Alsop, Edward, Rocester, Ashbourn  
 Alston, William E., per Messrs. Ollivier and Brown, Sackville Street,  
 Piccadilly  
 Arminson, W. B., M.D., Preston, Lancashire  
 Ashton, T. M., M.D., Ormskirk, Lancashire  
 Aspland, Alfred, Dunkinfield, near Ashton-under-Lyne  
 Atwell, Gregory H., Epsom  
 Audland, John, Tintern, Chepstow  
  
 Babbage, William, 1, Bengal Place, New Kent Road, S.E.  
 Babington, B. G., M.D., F.R.S., 31, George Street, Hanover Square, W.  
 Bacon, George Mackenzie  
 Bader, C., 2, Dean Street, Park Lane, W.  
 Baird, Andrew W., M.D., 3, Liverpool Terrace, Dover  
 Bankart, James, Guy's Hospital  
 Barker, Herbert, M.D., Bedford  
 Barlow, G. H., M.D., 5, Union Street, Southwark, S.E.  
 Barron, Edward Enfield, M.D., St. Thomas's Street East, S.E.  
 Barnes, Herbert Sedgwick, 182, King's Road, Chelsea, S.W.  
 Bassett, John, 1, St. Paul's Square, Birmingham  
 Bealey, Adam, M.D., 27, Tavistock Square, W.C.  
 Beardsley, Amos, Bay Villa, Grange, Newton-in-Cartmel, Westmoreland  
 Beaumont, John M.  
 Belfast Medical Society, through Mr. Greer, Bookseller, Belfast  
 Bell, Thomas, F.R.S., 17, New Broad Street, London, E.C.  
 Bennett, Sydney, 49, Old Steyne, Brighton  
 Benson, Stafford, Chatham, Miramichi, New Brunswick, North America  
 Berry, Henry Thomas, 12, Tysoe Street, Wilmington Square, W.C.  
 Biddle, H. C., Edmonton  
 Bidwell, Henry, M.D., Albrighton, Shiffnall, Salop  
 Birkett, Edmund Lloyd, M.D., 48, Russell Square, W.C.  
 Birkett, John, 59, Green Street, Grosvenor Square, W.  
 Birmingham Sydenham College, per Mr. Bassett  
 Birmingham Circulating Medical Book Society (through Bookseller)  
 Birmingham Medical Book Society (per Mr. Bassett)

Bishopp, James, 1, Lawn Place, South Lambeth, S.  
 Blasson, Thomas, Billingborough, near Folkingham, Lincolnshire  
 Blasson, Thomas, jun., ditto  
 Booth, Lionel, Dispensary, York  
 Bossey, F., M.D., 4, Broadwater Road, Worthing  
 Borough, Charles, All Saints, Derby  
 Brackenbury, R., 13, Brunswick Terrace, Brighton  
 Bradley, Charles L., 4, Belitha Villas West, Barnsbury Park, N.  
 Brett, A. T., M.D., Watford, Herts  
 Bright, John M., Forest Hill, Kent, S.E.  
 Brooks, A. D'O., Henley-on-Thames  
 Brown, Thomas, 16, Finsbury Circus  
 Brown, A. G., William Street, Woolwich  
 Brown, Burton, M.D., 16, Finsbury Circus  
 Browne, George, 35, Montpelier Road, Brighton  
 Browning, Charles, 13, Portsdown Road, Maida Vale, W.  
 Bryant, Thomas, 2, Finsbury Square, E.C.  
 Burton, John M., Lee Park, Lee, S.E.  
 Burt, George, 115, High Holborn, E.C.  
 Butler, William Harris, Guy's Hospital

Candy, John, Alstonfield, near Ashbourne, Derbyshire  
 Carey, Francis, M.D., 14, New Street, Guernsey  
 Carter, William G., M.D., Bellevue, near Clifton, Bristol  
 Chaplin, Thomas, M.D., 22, Brompton Crescent, S.W.  
 Chattaway, A. G., Kingsland, Leominster, Herefordshire  
 Clarke, John, Kenilworth, Warwickshire  
 Cleveland, W. F., 23, Beaufoy Terrace, Maida Vale, W.  
 Clogg, Stephen, East Looe, Cornwall  
 Clowes, Frank, Stalham, Norfolk  
 Cock, Edward, St. Thomas's Street, Borough, S.E.  
 Cockell, Frederick Edgar, 1, Alma Villas, Dalston, N.E.  
 Collett, Henry, M.D., Worthing  
 Collingwood, William, Gibraltar  
 Cooke, Robert H., Stoke Newington, N.  
 Cooper, George, M.D., Brentford, Middlesex, W.  
 Crew, John, Weldon, Wansford, Northamptonshire  
 Croft, John, 4, St. Thomas's Street, Southwark, S.E.  
 Crompton, Dickinson W., 17, Temple Row, Birmingham  
 Charlton, Egbert, Dartford, Kent  
 Couch, Thomas, Bodmin, Cornwall

Daldy, Thomas Mee, M.D., 39, Broad Street, City, E.C.  
 Daniell, George Williamson, Blandford, Dorsetshire  
 Davies, Ebenezer, High Street, Swansea  
 Davy, Richard, M.D., Chumleigh, North Devon  
 Day, Horatio Grosvenor, Isleworth, W.  
 Devenish, Samuel W., M.D., 7, Billiter Square, E.C.  
 Dewsnapp, Mark, Hammersmith, W.  
 Dix, John, 5, Albion Street, Hull

*List of Subscribers.*

v

Dolman, A. H., 15, Hull, Street, Derby.  
Dixon, John, M.D., 20, Prospect Row, Bermondsey  
Doubleday, Edward, 249, Blackfriars Road, S.  
Dublin Hospital Gazette, Richmond Hospital Library, Dublin  
Duke, Frederick, Buckingham  
Duke, Roger, Battle, Sussex  
Dulley, Benjamin, Wellingborough, Northamptonshire  
Dunn, Charles, Fareham, Hampshire  
Durham, Arthur, 30, Brook Street, W.  
Dutton, James, 2, Theresa Place, Hammersmith

Eastes, George, Folkestone  
Evans, Edward Hier, Risca, Newport, Monmouthshire  
Evershed, Charles L., Arundel, Sussex  
Evershed, Arthur, Guy's Hospital  
Ewen, Henry, Long Sutton, near Wisbeach, Cambridgeshire

Fagge, C. Hilton, M.B., Guy's Hospital  
Faircloth, John, M.D., Northampton  
Faircloth, Richard, Newmarket  
Farr, George F., West Square, Southwark  
Farr, Septimus, Hemel Hempstead, Herts  
Fawcett, Frederick, Museum Square, Wisbeach  
Few, William, Ramsay, near Huntingdon  
Fletcher, Bell, M.D., Birmingham  
Forman, C. Baxter, Guy's Hospital  
Forster, J. Cooper, 10, St. Thomas Street, Southwark, S.E  
Fowler, George, Kennington Park  
Fox, John, Upper St. Giles, Norwich  
Fotherby, Henry I., M.B., 40, Trinity Square, Tower Hill, E.C.  
France, J. Frederick, 24, Bloomsbury Square, W.C.  
Francis, D. J. T., M.D., Northampton  
Fuller, Thomas, M.D., Shoreham  
Freeman, Clarkson, M.D., Milton, County Halton, Canada West  
(through Bookseller)

Galton, Edmund J., Brixton Rise, Surrey  
Gayleard, Christopher, Rio Janeiro  
Giles, Harold, Coggeshall, Essex  
Giles, Samuel, M.D., 58, Ebury Street, S.W.  
Gittins, J. M., M.D., Barbadoes (care of Messrs. Treacher and Co.,  
London)  
Glasgow University (per Messrs. J. Smith and Son, 7, Vincent Street,  
Glasgow)  
Godfrey, Benjamin, M.D., Carlton House, Enfield, N.  
Goodday, Horatio, 76, Oxford Terrace, Hyde Park Gardens, W.  
Gorham, John, Tunbridge, Kent (through Bookseller)  
Graham, John, Brampton, Cumberland  
Graham, John, M.D., 15, Gloucester Road, Regent's Park, N.W.  
Graves, Ryves W., Barton Street, Gloucester

- Greenhow, H., M.D., 77, Upper Berkeley Street, W.  
 Griffiths, George, Milford, South Wales  
 Grosvenor Book Club  
 Grove, W. R., Huntingdon Hospital  
 Growse, Robert, M.D., Brentwood, Essex  
 Growse, J. L., Bideston, Suffolk  
 Gruggen, W. J., Woodcroft, Smithdown Lane, Liverpool  
 Gull, W. W., M.D., 26, Brook Street, Grosvenor Square, W.  
 Guy's Hospital Library (Two Copies)  
 Gwynn, Samuel Tayleur, Whitchurch, Shropshire
- Habershon, S. O., M.D., 22, Wimpole Street  
 Hall, Alfred, M.D., Old Steyne, Brighton  
 Harding, C. F., Guy's Hospital  
 Harding, George D., 20, North Kent Terrace, Station Road, Woolwich  
 Hardwick, Robert G., M.D., Park Square, Leeds  
 Harris, William, Worthing, Sussex  
 Harrinson, I., Reading  
 Hawkins, J. V., M.D., Paradise House, King's Lynn  
 Hewitt, F. H., M.D., 24, George Street, Hanover Square  
 Hibbard, E., 67, Union Street, Southwark  
 Hicks, John Braxton, M.D., F.R.S., 9, St. Thomas's Street, Southwark  
 Higgins, Charles Hays, M.D., Grange Villa, Cloughton, Birkenhead, Cheshire  
 Hills, Wm. Charles, M.D., County Lunatic Asylum, Thorpe, Norwich  
 Hilton, John, F.R.S., 10, New Broad Street, E.C.  
 Hindle, F. T., Askerne, near Doncaster  
 Hinton, James, 5, George Street, Hanover Square, W.  
 Hinton, Joseph, Hinton, near Bath, Somersetshire  
 Hitchman, John, M.D., Derby County Asylum, Mickleover, near Derby  
 Holman, Constantine, M.D., Reigate, Surrey  
 Holman, H. Martin, M.D., Hurstpierpoint, Sussex  
 Holman, Thomas, East Hothley, Sussex  
 Hood, William Charles, M.D., Croydon  
 Housley, John, M.D., Warsop, near Mansfield, Notts  
 Howard, Dr., Montreal, Canada (per Messrs. Lindsay, Bristow, and Co., Bread Street, Cheapside)  
 Hutchinsson, V., Bishop Auckland, Durham  
 Hutchins, Henry E., Hospital, Canterbury
- Ince, John, M.D. (per Messrs. Grindlay and Co.)  
 Ingle, Robert N., Melbourne, Derbyshire
- Jackson, Henry, St. James's Row, Sheffield  
 Jackson, John Hughlings, M.D., 5, Queen Square, Russell Sq., W.C.  
 Jacobs, Henry, 39, Addison Gardens, Kensington, W.  
 Jepson, George Theophilus, Hampton, Middlesex  
 Johnson, Charles, Norfolk Terrace, Coldharbour Lane, Camberwell, S.  
 Johnson, W. F., Essex and Colchester Hospital  
 Jones, J. Edwards, Brynffynon, Dolgelly, North Wales

- Jones, Podmore W., M.D., Shrewsbury  
Jones, Edward Podmore, Wellington, Salop  
Jones, Walter, College Yard, Worcester  
Joyce, Thomas, 1, Berkeley Gardens, Kensington, W.  
  
Kellock, W. B., Stamford Hill, Stoke Newington, N.  
Kelsey, A., Army  
Kent, Thomas J.  
King, Osmer, Royal Hill, Greenwich  
King, George Henry, M.B., Horncastle, Lincolnshire  
King, T. K., M.D., 23, Addington Place, Camberwell  
Kingsford, Edward, Sunbury, Middlesex  
Kingsford, Charles, M.D., 6, Champion Place, Upper Clapton, N.E.  
Kitchener, Thomas, M.D., 58, Pembroke Terrace, Jersey  
  
Lamb, Joseph, North Dispensary, Vauxhall Road, Liverpool  
Lansdown, F. P., 22, College Green, Bristol  
Lipscomb, John Thomas, N., M.D., St. Alban's, Hertfordshire  
Lloyd, Edward, M.D., Aberpergwn, Neath  
Lund, Edward, 22, St. John Street, Manchester  
Lye, J. Bleack, M.D., Castle Street, Hereford  
Lyell, Henry, Guy's Hospital  
Lyon, F. W., M.D., Lyndhurst, Hants  
  
Mackie, J., M.D., Cupar, Fife  
Madge, Henry, M.D., 32, Fitzroy Square, W.  
Manby, Frederick, East Rudham, Rougham, Norfolk  
Marshall, Edward, Mitcham, Surrey  
Martin, F., M.D., 19, Lower Phillimore Place, Kensington  
May, Edward Henry, 13, Great Trinity Lane, Cannon Street West, E.C.  
Merriman, C. A., Knutsford, Cheshire  
Mickley, Arthur, Buntingford, Herts  
Millar, James, 9, Archibald Place, Edinburgh  
Milward, James, Guy's Hospital  
Montefiore, Nathaniel, 36, Hyde Park Garden, W.  
Moon, Henry, M.D., 9, Old Steyne, Brighton  
Moon, R. H., Buckingham  
Morley, Edward T., M.D., 35, King Street, Blackburn  
Morley, George, Leeds  
Morris, Edwin, M.D., Spalding, Lincolnshire  
Morris, Mathew, 8, River Terrace North, Islington, N.  
Moxon, Walter, M.D., 6, Finsbury Circus  
Muriel and Lacey, Messrs., 4, Wellington Street, London Bridge, S.E.  
Muriel, John, Palace Green, Ely, Cambridgeshire  
Muriel, Charles Evans, 71, St. Giles Street, Norwich  
  
Nason, Edward, 14A, Portland Street, Leamington  
Nason, John James, M.B., Stratford-on-Avon  
Nason, Richard B., Nuneaton, Warwickshire  
Nazer, Henry, Clare, Suffolk  
Nihil, John, R.N.

Nisbett, Robert Innes, 29, Milton Road, Gravesend  
 Norman, Serjeant, J. C., M.D., 18, Gerrard Street, Leicester Square  
 Norris, William Lascelles, Brierly Hill, Staffordshire  
 Northampton Infirmary Library  
 Nottingham Med.-Chir. Soc. per E. B. Truman, Esq., General Dispensary  
 Nunneley, John, Leeds

Odling, William, M.D., F.R.S., St. Bartholomew's Hospital  
 Oldham, Henry, M.D., Finsbury Square, E.C.  
 Oldham, James, 53, Norfolk Square, Brighton  
 O'Grady, E. S., Jun., 9, Merrion Square South, Dublin

Padley, George, Northampton Lodge, Swansea  
 Palfrey, James, M.D., 12, Wellington Street, Borough, S.E.  
 Pavy, F. W., M.D., F.R.S., 33, Bedford Place, Russell Square  
 Payne, Arthur (per Smith, Elder, and Co.)  
 Peat, Thomas, Manningtree, Essex  
 Phillips, Richard, 52, Leinster Square, Westbourne Grove, W.  
 Phillips, J. J., Guy's Hospital  
 Pigg, Charles, Vernon House Asylum, Britouferry, near Neath  
 Poland, Alfred, 58, Welbeck Street, Cavendish Square, W.  
 Powell, Henry, M.D., Craven House, Lansdowne Road, Brighton  
 Prall, Samuel, West Malling, Kent  
 Prance, R. R., M.D., Hampstead  
 Pring, E. S., Guy's Hospital  
 Purden, T. H., M.D., 5, Wellington Place, Belfast

Ramskill, Josiah, 3, Meadow Lane, Leeds  
 Ramskill, J. S., M.D., 5, St. Helen's Place, Bishopsgate, E.C.  
 Rand, John, Walton, near Ipswich  
 Rawdon, Henry, M.D., Liverpool Royal Infirmary  
 Ray, Edward, Dulwich, Surrey  
 Rees, G. Owen, M.D., F.R.S., 26, Albemarle Street, W.  
 Richards, E. W., Prospect House, Finchingsfield, Essex  
 Ridge, Joseph, M.D., 39, Dorset Square, N.W.  
 Ringer, Theobald, M.D., Bengal (per Smith, Elder, and Co., Cornhill)  
 Roberts, Alfred, Castlereagh Street, Sydney, New South Wales  
 Roberts, Bransby, Eastbourne, Sussex  
 Roberts, Griffith William, Clwtybont, Carnarvon  
 Roberts, J. H., 10, Finchley Road, St. John's Wood, N.W.  
 Rogers, Robert J., Sussex County Hospital, Brighton  
 Rooke, Thomas Morley, M.D., 13, Imperial Square, Cheltenham  
 Roots, Sudlow, Kingston-on-Thames, Surrey  
 Roper, George, 180, Shoreditch, N.E.  
 Roscow, Thomas T., M.D., 1, Summer Place, Onslow Square, Brompton, S.W.  
 Rowland, R., Strata Florida, Cardiganshire  
 Rump, Hugh Robert, Wells, Norfolk  
 Salter, S. J. A., M.B., 17, New Broad Street, E.C.  
 Scott, Francis, Bridport, Dorsetshire

Sells, Thomas J., Guildford  
Seymour, Almeric, M.D., 53, Montpellier Road, Brighton  
Shearman, E., M.D., Rotherham  
Skinner, William A., King's Cliffe, Wansford, Northamptonshire  
Sleight, Robert Leadam, 21, Albion Street, Hull  
Sloman, S. George, Farnham, Surrey  
Smith, Charles Swaby, Burbage, Marlborough, Wilts  
Smith, W. Henry  
South London Medical Reading Society  
Starling, George, Guy's Hospital  
Staffordshire, North, Medical Book Society (per J. B. Davis, Shelton, Staffordshire)  
Stedman, John B., Godalming, Surrey  
Stilwell, Robert R., Beckenham, Kent  
Stocker, James, Guy's Hospital  
Stocker, John Sherwood, M.D., 57, Cumberland Street, Hyde Park, W.  
Stormont, Henry J., Cheshunt, Herts  
Spry, George Fred., Army

Taylor, Alfred S., M.D., F.R.S., 15, St. James's Terrace, Regent's Park, N.W.

Taylor, Arthur, Guy's Hospital

Taylor, Charles, M.D., 4, Bethel Place, Camberwell, S. (through Bookseller)

Taylor, Thomas, 10, Bennet's Hill, Birmingham

Thurston, E. W., Guy's Hospital

Towne, Joseph, Guy's Hospital

Truman, E. Beckit, Nottingham

Tuke, John Henry, Thorverton, Devon

Tyerman, D. F., Colville House, Lowestoft, Suffolk

Underhill, W. Lees, Tipton Green, Staffordshire

Valentine, Edmund William, Somerton, Somersetshire

Veasey, Henry, Woburn, Beds

Venour, William, Army (per Mrs. Venour, Teddington, Middlesex)

Wallace, Richard U., M.D., 1, Trafalgar Place West, Hackney Road, N.E.

Ward, W., M.D., Huntingdon

Warwick, William R., Southend, Essex

Washbourne, Buchanan, M.D., Gloucester

Watkins, Walter, Brecon, South Wales

Weaver, F. P., M.D., 10, King Street, Chester

Weber, Hermann, M.D., Finsbury Square, E.C.

Welch, Thomas D., M.A., M.B., Guy's Hospital

Weston, E. F., Stafford

White, B., M.D., Pump Street, Londonderry

White, Charles, Warrington

Whitley, George, M.D., Trinity Square, S.E.

Wilks, Alfred G. P., M.A., M.B., Guy's Hospital



*List of Subscribers.*

Wilks, Samuel, M.D., 11, St. Thomas's Street, Borough, S.E.  
 Willett, Edmund S., M.D., Wyke House, Sion Hill, Isleworth  
 Williams, Thomas, M.D., F.R.S., Swansea  
 Williams, William, Dolgelly, Merionethshire  
 Wilson, John B., Queen Street, Whitehaven  
 Wilson, Robert James, M.D., 24, Grand Parade, St. Leonard's  
 Wise, William C., Woolwich  
 Workman, John W., Reading  
 Wotton, W. G., King's Langley, Herts  
 Wotton, Charles, ditto  
 Wright, Chas. J., Westgate, Wakefield, Yorkshire  
 Wright, W. H., 1, Clapton Square, Hackney  
 Wright, W. E., Guy's Hospital

*Corrections and changes of residence to be forwarded to the Editors.*

The Subscription List for Vol. X will be closed on the first of  
September, 1864.

## IN EXCHANGE.

American Journal of Medical Science (care of Messrs. Trubner and Co.,  
60, Paternoster Row, E.C.)

Royal London Ophthalmic Hospital Reports.

Archives of Medicine, Dr. Lionel Beale, 61, Grosvenor Street, W.

ON THE  
SYPHILITIC AFFECTIONS  
OF  
INTERNAL ORGANS.

---

By SAMUEL WILKS, M.D.

---

THE syphilitic affections of the internal organs of the body constitute a subject which is comparatively novel, and one, therefore, which is still open to further investigation. Although it is but a few years since specimens illustrating it were received with more than incredulity by the profession, yet so strong has been the evidence in favour of modern observations, that few pathologists now retain any doubt about their general truth. Scepticism, however, does still largely prevail. It is the knowledge of this feeling which has mainly prompted me to the publication of the following cases, for these will place in a clearer light what amount of evidence a large institution can produce in favour of the facts which are wished to be promulgated. They will show sufficient, I think, to prove the doctrine, and at the same time will make it appear that the syphilitic diseases of the internal organs are not of daily discovery at Guy's Hospital, as has been surmised.<sup>1</sup> Some surprise, indeed, may be evinced at our poverty rather than our richness in illustration of the subject, especially as I have

<sup>1</sup> A very similar exaggerated notion prevails in reference to Addison's disease of the supra-renal capsules. Those who are unbelieving as to its existence come to Guy's, and expect to be shown half a dozen cases in the wards, when they ought to know that scarcely double that number has ever occurred in the hospital.

introduced a number of cases which may be considered equivocal. I have done this, however, for the sake of putting all the facts which have come under my own notice before the reader, so as to avoid placing the doctrine on any false basis, by omitting doubtful instances and selecting favorable ones. The whole subject is not yet sufficiently worked out to enable me rigidly to form a theory from it. Although I think that the report, standing as it does, is quite sufficient to prove the great fact which is wished to be inculcated—that the syphilitic affections are more widely diffused through the system than was until lately ever conceived to be the case.

It is necessary to allude to the scepticism which prevails upon the subject, and the reason for this, because herein will be found an explanation why it has been left to modern times to more thoroughly reveal the nature of syphilis; also in order to refute an opinion held by some, that its very novelty is an objection to its reception, since the disease under consideration is one which more than any other has been studied for centuries by men of note. The explanation of the unbelief, however, is so simple, and so clearly traceable to one cause, that the mere novelty of the observations can have no weight against their general reception. The reluctance to their admission is referable to the partial manner in which syphilis, as well as many other diseases, has hitherto been regarded, and is clearly owing to the division of our art into that of medicine and surgery; the result being, that when a disease which affects the whole body is regarded exclusively either by the physician or surgeon, it is necessarily looked upon in a partial light, and from one particular point of view, instead of being regarded, as it should be, in its integrity. Thus it has happened that many pathological subjects, such as pyæmia, cancer, &c., have been studied in too narrow a field, because either the surgeon or physician has regarded them from his own stand-point. This is eminently true of syphilis. In this disease, when the virus has entered the system, there appears to be scarcely a tissue which may not be affected, and always in one particular and characteristic manner. Knowing that many parts of the body were thus affected, all *à priori* reasoning might have led our ancestors to the supposition that even internal organs might be involved in a similar

process ; but not regarding these they, of course, remained in ignorance ; at the present day, however, when no such excuse exists, and the interior of the body is more thoroughly examined, some surprise must be expressed at those who still remain incredulous. The reason, however, for whatever scepticism remains is, I repeat, clear, and is due to the surgeon having hitherto been the principal observer in venereal disease.

This is said with no feeling of disparagement to the professor of that branch of our art, for the division of the latter into that of medicine and surgery will always probably be most convenient in our large towns ; but, nevertheless, with all its paramount advantages, there are drawbacks arising from the separation, for a moment's consideration will teach us that many of our ailments cannot be divided into external and internal, as we artificially consider them to be ; and, consequently, that if looked upon from this or that point of view exclusively, a very erroneous and partial conclusion must be arrived at concerning them. This appears to be the obvious and simple explanation of the internal syphilitic affections having been so long overlooked.

Hitherto, then, it has been said that every part of the body which could be seen, handled, or was able to present any outward signs of disturbance, might be affected by syphilis ; and it was only now and then that a shrewd observer had his suspicion raised with regard to the contamination of internal organs.<sup>1</sup> Thus it is that the older writers have spoken of affections of the skin, with its appendages, as the hair and

<sup>1</sup> The ordinary well-known effects of syphilis on the body, as recognised for centuries, are nearly all embodied by our great poet in the lines which he places in the mouth of Timon, when addressing the mistresses of Alcibiades :

“ Consumptions sow

In hollow bones of man : strike their sharp shins,  
And mar men's spurring. Crack the lawyer's voice,  
That he may never more false title plead,  
Nor sound his quilllets shrilly : hoar the flamen,  
That scolds against the quality of flesh,  
And not believes himself : down with the nose,  
Down with it flat ; take the bridge quite away  
Of him, that his particular to foresee,  
Smells from the general weal : make curl'd pate ruffians bald ;  
And let the unscarr'd braggarts of the war  
Derive some pain from you.”

nails; of diseases of the bones, especially those which might be felt during life; of inflammation of the eye, but only of the iris, &c.; also of the interior of the mouth, as far as vision could reach; and what is remarkable, some at a very early period, alluded to disease of the testes, which, it must be remembered, are really viscera, although placed in man external to the body. As far, then, as he looked, the surgeon in former times perceived the effects of the syphilitic virus; but it is now maintained that, in consequence of the more frequent practice of post-mortem examinations, the extent of the influence of syphilis is only commensurate with the tissues of the body, and that, therefore, internal parts of the organism may be affected as well as the external.

I would rather have been content with the simple report of our cases than have prefaced them with these remarks, but have thought it absolutely necessary to do so in order to afford an explanation of the apparently remarkable fact, that the subject before us, taken as a whole, is a modern one, a fact which might be used, as it has already been, as an argument against its truth. The explanation, I say, is necessary, as affording the clue to the previous want of knowledge and the modern scepticism.

I would therefore insist, *in limine*, in reference to this subject, that the whole of the modern theories have been mainly in the direction of discovering a wider extent of influence for the venereal virus, and have not, as some have supposed, tended to the establishment of a syphilitic cause for various well-known internal diseases. The modern doctrine simply maintains that the internal organs may be affected equally with the external; that not only the cranium, but the brain within it, or the nerves; not only the muscles of the limbs and tongue, but the heart; not only the pharynx, but the œsophagus; not only the larynx, but the trachea, bronchi, and lungs; also the liver, spleen, and other viscera.

*The peculiar effects of syphilis on the system.*—In syphilis there is a disposition to the effusion of a low form of lymph, or fibro-plastic material, in nearly every tissue of the body, occasionally modified in character to a slight extent by the organ in which it occurs. Consequently in those who have died suffering from this disease there is scarcely an organ but what may

be found affected in this particular way. In solid organs, or in the interior of the tissues, there is found a more or less circumscribed deposition of an albumino-fibrous material, whilst on the surface of the body a similar material may constitute merely the base and border of an ulcer; for just as cancer and tubercle, in their own peculiar diatheses, show themselves as masses of disease in the solid organs, and as ulcers in the skin or mucous membrane, so in syphilis the viscera may be found full of the syphilitic material, whilst on the pharynx, larynx, &c., an ulceration may also exist.

*What is meant by primary, secondary, and tertiary syphilis.*—

The above-mentioned deposit, I say, takes place in constitutional syphilis; but writers have hitherto divided the latter into secondary and tertiary, and therefore some remarks will be necessary in order to discover what these terms signify, and so clear the ground for our further observations. In the first place, it may be said that no subject of medicine is more confused than this, no two writers agreeing as to what are the secondary or what the tertiary effects of syphilis, the division being evidently an artificial one, this want of precision even sometimes necessitating in their writings the description of the tertiary before the secondary, and even obliging us to recognise tertiary symptoms in the new-born infant, and which, of course, must have allowed a very rapid progress of the previous stages. The only point in common with most writers is this—that since tertiary symptoms follow secondary, all affections which succeed in a few weeks or months to the introduction of the virus are called secondary, and those which are observed when the patient's system has been thoroughly imbued with the poison, and is suffering a cachexia in consequence, are styled tertiary. Thus, some forms of eruption, as the scaly and papular, are called secondary, whilst others, of the vesicular and ecthymatous kinds, are named tertiary. Some writers have said that whilst the effects of syphilis are confined to the external parts the disease is secondary, but if to the internal and deeper the disease is tertiary; but this is only saying that whilst the patient is alive and under notice we style his symptoms secondary, but if he dies it is an evidence that he must have passed through these, and therefore all the morbid conditions then found are necessarily tertiary—a most indefinite

and unscientific arrangement—a mere employment of terms which time and use had caused writers to venerate, without a just discrimination of their value.

Thus, if effused lymph on a bone be called a secondary symptom, and effused lymph of the same character in the liver a tertiary condition, as is very often done, it is inferred that the latter affection occurs at a much later period than the former, but this is altogether an assumption, and founded simply on the fact that the one is necessarily discovered at a much later period than the other, and so it is with many other of the morbid conditions met with. The error arises from the difficulty of determining whether a deposit found in the dead body is to be regarded as denoting the existence of some morbid condition occurring about the time of death, or is merely the result of a state long past and now eradicated; that is, there is a difficulty in deciding as to the age of such a deposit of fibro-plastic material of which I have spoken. For example, an enlargement over the tibia, suggesting a syphilitic node, may be either the result of a recent infection or of a disease whose virulent nature has long passed; to which of the two the case belongs the history must divulge; but because this has not disappeared when the patient dies of the so-called tertiary disease, the node must not be regarded as tertiary in its character. As regards the internal organs, however, there is more difficulty in deciding, since the history may often fail to guide us, for it has yet to be learned how far the occurrence of these deposits is attended by evident symptoms; for example, it may be found, by further observation, that the production of a syphilitic albuminous material in the liver may be attended by some hepatic disturbance, but as yet there is no proof that such is the case, since in some instances, as that of the testes, such deposits may arise without accompanying symptoms. If, then, this be true, and we are unable at present to determine at what time they occur, it is altogether an assumption to name these internal affections tertiary, since, when the patient has died in consequence of syphilis, he of necessity has been ailing for a very long period, and has reached, at the time of his death, that stage which is usually called tertiary. By the same method of reasoning, should a node on the bone not be observable, because not on the exterior of the body, but first

brought to light after death, it ought to be placed amongst the tertiary symptoms. The fact seems to be that, owing to the peculiar nature of the deposit which is thrown out, a part of it only admits of absorption; the remainder, becoming dried up into a hard mass, continues for the remainder of the patient's life. Whilst, therefore, the time of the occurrence of such internal depositions is hidden, but since the latter are seen to resemble those which are known to take place during the so-called secondary stage, there are good grounds for supposing that the one occurs at the same period as the other, and under the same circumstances and influences. This is a more just inference than the one usually adopted—that the internal are necessarily of later occurrence than the external deposits, because not found until after death.

It is important to determine thus accurately what are the effects of constitutional syphilis, for then we shall be better prepared to understand what is signified by tertiary syphilis. It is not my desire to encroach on any question purely in the province of the surgeon, but looking at the subject from a medical point of view, or rather pathological, and without any bias derived from the practice of a special department of the profession, I should say that whilst the system is still contaminated by the syphilitic poison there is this disposition to the production of lymph; and also the converse—that the discovery of such disposition existing must be regarded as evidence of the presence of the venereal virus.

*If constitutional syphilis be styled secondary, what is meant by primary syphilis?*—The first sore on the surface of the body is said to constitute the primary disease, and if this sore be not readily healed and the system be contaminated, secondary symptoms are said to result. The consequence of such a definition is that primary syphilis is not syphilis at all. This is in accordance with the modern theories of simple non-infecting sores, and is quite in agreement with the long-standing idea of the physician, who has never regarded syphilis other than a constitutional disease, any more than he has declared a patient to be suffering from smallpox or hydrophobia if an attempt at inoculation had been made, but the virus had not taken (as the common phrase is), that is, the system not affected. As then he did not say, when his patient was inocu-



lated, that he had primary smallpox and afterwards secondary smallpox, so he never considered a patient to have syphilis unless there was proof of his system having been affected. No medical man, I say, ever placed in his notes of the history of a case that his patient had had the venereal disease because he informed him that he had several times had sores. These views, long held, are now being taught and explained in a more systematic manner by the surgeon, for now, according to Ricord, a sore no more means syphilis than the bite of a mad dog means hydrophobia, unless the system be infected; moreover, that the peculiar deposition of fibro-plastic elements, of which I have spoken taking place in the chancre, is a sign in itself that the system is affected. The surgeon, therefore, at the present day divides the sores, according as an induration exists or not, into infecting and non-infecting, although the character of the former can only be decidedly pronounced after a certain period, for should it be destroyed at once by caustics or other means no infection would result. Let it, however, continue for a few days, and an induration appear—this is itself evidence of the system being already contaminated. Accordingly, as Ricord says, induration of a chancre is not to be regarded so much as the origin or cause of syphilis as a consequence of the constitutional affection. It is less a *cause* than an *effect*; the induration which subtends the base of a chancre is but a kind of local reaction of the general poisoning; it is, so to say, the first of the secondary symptoms; the indurated chancre is but the prelude to a diathesis, and this is syphilis. The compiler of Ricord's lectures quotes a remarkable passage from Ambrose Paré, to the following effect:—"If there is an ulcer on the penis, and if the part is hardened, it will be an infallible sign that the patient is affected with syphilis." I cannot, therefore, but think that if surgery had sought the aid of pathology in the dissection of syphilitic patients, that these important truths would have been long ago arrived at and adopted; but at length, even as regarded from a narrow point of view, the subject appears to be unfolding itself in accordance with the ideas evolved from a larger sphere of observation.<sup>1</sup>

<sup>1</sup> If it be true that syphilis is a constitutional disease, and requires appropriate treatment, it would show that it is a malady coming as much within the province of the physician's as the surgeon's practice, or at least after the first week of its occur-

In constitutional syphilis, then, there is seen this disposition to the production of lymph, and beginning first of all in the chancre itself. According to Ricord, if a person is inoculated, about the fifth day the subjacent tissue becomes infiltrated by a plastic lymph, which produces to the touch the peculiar hard and elastic feeling. Previous to this, if the sore be destroyed, the system is not affected ; as, therefore, the term primary, in its strict sense, can only be used for a short period, it would be adopting a more precise nomenclature if this term and that of secondary were abolished, and the simple term syphilis be used instead. This, however, would seem to imply that, whilst the patient has a disease which can be simply styled syphilis, some virus must still exist in his blood or elsewhere. That some morbid state exists is proved by the symptoms and by the disposition to the effusion of lymph before mentioned ; but whether a true venereal poison is present, which is capable of propagation, is still a question. With the writings of so eminent an authority as Ricord before me, one would fain hesitate before expressing a contrary opinion to his ; but, in spite of the weight of his name, I cannot but think that the evidence is very strong in support of the view that, whilst constitutional effects are seen in the system, the virus is still active. That it is capable of propagation, under certain circumstances, requires no proof here ; for the fact of a father tainting his offspring, or a child its nurse, are facts to be observed every day. The latter fact I think clearly proves that it is only the absence of favoring circumstances which prevents contagion being more frequently seen, for let a discharging surface come in contact with an abraded part or a mucous membrane, and the contamination would, I believe, be at once observed, many facts tending to prove the position. The wide-spread contamination which may occur from the suckling of syphilitic children has been proved beyond doubt by Diday, whose work is now in the hands of every medical man. This writer says, "I could quote certain villages and cantons in which venereal

rence. Such an opinion was held by my late colleague Dr. Addison, who, although studiously obsequious in all matters relating to medical practice, always maintained that syphilis, being a constitutional disease and requiring mercury, was one which he never refused to treat from the first day of inoculation. This is a practice, however, not to be inculcated if the virus can be immediately eradicated by local means.

disease is unknown. A nursing arrives, and the plague at once breaks out. Perfect health of the population until then; from that moment syphilis attacking almost epidemically the nurse and her family, the husband, children of three or four years old, old women of sixty, and extending to two generations in each direction." To show that such opinions have always existed in the minds of some in our own country, I will give from Dr. Copland a passage as quoted by Dr. Elliston in connection with a case which the latter publishes in proof of the contagious nature of the so-called secondary stage:—"I have ever had sufficient reason to conclude that, whenever a secondary venereal ulceration seated in the integuments or mouth or throat produces a secretion or discharge which comes in contact with a mucous surface, or with an abrasion of a cutaneous surface, or is even allowed to remain in contact with an unabraded surface, infection is liable to take place, and that this liability exists both in children and in adults. The communicability of secondary syphilis, especially when the sores have proceeded to secrete a fluid exudation, was a well-recognised fact in former times, and has been witnessed by myself during the course of my experience in several instances. It was a recognised fact by Dr. Colles; and although Hunter believed that secondary symptoms could no longer infect, Mr. Babington remarks, when commenting on this belief, that 'the facts (that they do infect) are so well established, that it is more easy to question the principle than to doubt the facts.' This mode of communicating the malady was often observed in all the varieties of it described as syphilitic diseases, and in the usual manifestations of the malady from the end of the fifteenth century to the close of the seventeenth century, or even later." It is impossible here to quote examples in proof, or more authorities; but I am inclined to the opinion that, whilst there is seen to be a disposition in the body to the production of a fibro-plastic material, and therefore a state remediable by remedies such as mercury, that a virus exists in the system which is capable of propagation. How long this may endure, or may be modified by time, are very important questions of another description which require solution.

*What is meant by tertiary syphilis.* — If the so-called secondary syphilis, or that which is simply syphilis, possesses

certain characteristic phenomena, we have a means of recognising its existence ; and if, therefore, we find such phenomena classified amongst the tertiary or ulterior changes of the disease, we must replace them in their proper position. Writers, however, have not only spoken of changes already alluded to, as being sometimes secondary and sometimes tertiary, but they have referred to other totally different morbid conditions under these names, and which, therefore, clearly require separation. These I should regard as the ulterior results of syphilis, not immediately dependent upon it, although induced by it. They are different from the peculiar effects of syphilis already spoken of, and can only be regarded as the sequelæ. Any form of cachexia, indeed, may produce them, although it is especially those parts which have been in the first place affected by syphilis which suffer, and thus it is not so much the character of the change which denotes the syphilitic origin as the site of the disease. Thus, the bones are affected in syphilis in a manner which is generally characteristic ; but if from any cause the patient fall into a bad state of health, an extensive caries or necrosis of the ordinary kind may result. The first change is syphilitic, the second is a sequela of syphilis. Several cutaneous affections resembling these sequelæ may occur under various circumstances, as, for example, ecthyma and rupia in impoverished strumous children. So also the syphilitic disease of the larynx may proceed under certain circumstances to disease of the cartilages, but the latter may occur independently of the syphilitic taint. Besides these aggravated diseases, arising in organs first affected under the influence of the venereal poison, but which have ceased to be syphilitic, and therefore to be regarded as the sequelæ rather than results of a tertiary stage, there are other changes in the organs which have received a considerable share of attention of late years. I refer to the lardaceous or waxy disease of the viscera.<sup>1</sup> In persons who have been worn out by syphilitic

<sup>1</sup> See, in reference to this subject, a paper in the 2nd volume of the present series, of this work. One author, not content with showing that this lardaceous change is a frequent consequence of syphilis, has been inclined not only to connect it intimately with the disease, but has pretended that the indurating material of the chancre is changed blue by iodine, in the same manner as it is asserted that the lardaceous material is. With reference to this, I need scarcely repeat the statement

disease, and been suffering long from a resulting cachectic habit, such state of organs may be very fairly predicted to be present; but they are by no means evidence that syphilis has existed, since they occur in cachexia arising from other causes. They are constantly found in young scrofulous subjects, who have been long ill with some local disease, as of a joint or a bone, and therefore cannot by any means be regarded as connected essentially with syphilis. The latter term should, therefore, be altogether removed from that form of affection in which they are found to exist. If the cachexia under which they occur be induced by syphilis, then let the cachexia be regarded as the sequela, and not styled the tertiary stage. Should, however, writers wish to retain the latter term, let it be strictly confined to this condition, and not made to include that in which the results of true syphilis are also found.

The subject, therefore, frames itself to my mind in this way : that the so-called secondary syphilis should be simply styled syphilis, and that the disease is known to exist so long as certain phenomena occur, these being exemplified more especially by the exudation of lymph in the various tissues of the body, thus showing that a morbid action is still in existence, and, according to some authors, a virus capable of being propagated in various direct and indirect manners. This virus may be exterminated by remedies, or may wear itself out, and the patient recover his health ; but not infrequently, as a consequence of the vitiation which the constitution has undergone (although the syphilitic poison may itself have disappeared), a morbid state of system may have been produced, tending sometimes to a fatty degeneration of the various structures of the body, but more especially to that change known as the lardaceous or waxy. This might with more propriety be called the second stage, or, if preferred, the tertiary stage, but one to be distinguished from the preceding, inasmuch as the virus was then still present, whilst in the latter it has departed, the changes in the tissues being attributable to the cachectic condition, and therefore not unlike what may arise under other circumstances. Such a division of the disease into syphilis and its sequelæ is

made in the above-named article, that all proof is wanting that the material is *amyloid* ; indeed, the recent investigations of Dr. Montgomery seem to prove the correctness of Meckel's suggestion, that it is cholesterine.

one which I have long proposed to myself, finding it a simple one, and warranted by clinical experience as well as by pathological research.

The post-mortem discoveries of the combination of the results of the secondary and tertiary stages should present no difficulty, since much of the albumino-fibroid material formed in the true syphilitic stage is incapable of absorption, and remains during the life of the patient. Deposits of this kind may, therefore, be found in the livers of those who have quite recovered from the disease, and may have died many years afterwards of an independent malady, or may be found in those who have succumbed to the ultimate effects of syphilis in the so-called tertiary stage. Because they are discovered in co-existence with ulterior changes, they are not, therefore, to be regarded as necessarily of the same age with them; for example, a lardaceous liver with fibroid deposits in it is rather to be looked upon as an exemplification of two distinct morbid phases, than showing occurrences of the same period. This explanation will remove many of the difficulties in the way of separating the stages of the disease, but not hitherto made quite clear, because amongst syphilitic subjects the greater number would be found dying at the later periods than at the earlier ones, and therefore all internal affections would be placed in connection with that stage in which death took place. All experience and analogy, however, would show that these affections arose at an earlier time, and been merely carried on to a later period when they were made manifest to the eye.

I would not go so far as to draw in every case an absolute line between the secondary and tertiary stages, nor to say that because ulterior changes had commenced that all secondary had been removed, for in cachectic patients, in whom it could not be said that degeneration of the tissues had not commenced, it would seem sometimes as if syphilitic taint had also not quite disappeared.

*Effects of mercury.*—The present subject involves so many considerations that it has been found impossible to neglect them, and amongst others there is the question relating to the effects of mercury. At no time are the consequences of syphilis discussed by members of the profession but the effects of long-

continued mercurial administration are associated with the question. For this there seems good reason, although the opinions held regarding it are apparently most conflicting, some of the older school maintaining that the prolongation of our cases at the present day is due to a less abundant use of mercury in the attempt to cure the disease locally, whilst many of the modern school refer the ravages of syphilis of former days to the universal and too free administration of the drug at that period ; they point to the caries and necrosis of the bones, shown by the destruction of large portions of the cranium, as evidence of the superiority of the later to the older method. These statements are probably both correct, and by no means incompatible. It will be perceived that it is assumed that the effects of syphilis and mercury are alike, and therefore it may be asked whether the question could ever arise were we properly acquainted with the peculiar effects of each. I believe there are many eminent men who hold the opinion that some of the worst forms of disease observed in syphilitic patients, especially the necrosis of bones, are due to mercury,<sup>1</sup> and thus the greater frequency of this form of disease in by-gone years, when this metal was more freely and more indiscriminately administered. But how is this to be reconciled with the fact that mercury does not affect the bones ? Experiments have been made repeatedly on animals, and all observers have agreed that the bones are not affected by the drug. Moreover, mercurialism is continually produced in artificers in quicksilver ; of such I have seen several cases, where paralysis had existed so as to deprive the patient of locomotion, where the mind also has been impaired, and, in fact, the whole body undergoing decay, and yet the bones had escaped. It has been said also that mercury produces other effects resembling those of syphilis, but of this there is even less proof. The opposite of such statement I believe to be nearer the truth, the tendency of syphilis in the constitution being to the production of a plastic lymph in the tissues, whereas the effects of mercury are the very reverse ; they are, indeed, antagonistic, tending to the absorption of new tissue, if such exist—and if it do not, to the

<sup>1</sup> I believe I am right in saying that this is the opinion of my respected colleague Mr. Cock, as it was also of the late Dr. Addison.

destruction of the old. In syphilis there is a formative action, in mercury a destructive one.

I think all such contradictory opinions to which I have alluded are clearly explicable if the division of the subject according to the secondary and tertiary forms of the disease be strictly maintained, or rather, as I would have it, into syphilis and its sequelæ. The former, or secondary, shows the effects of the virus in the albuminous deposition, whilst the tertiary exhibits the degeneration of the tissues due to the morbid action so long in process. Mercury is antagonistic to the first, but in unison with the second. It does not produce symptoms like those of the former, but only of the latter; but these are not syphilitic at all, but due to cachexia merely. Mercury, therefore, is antagonistic to the syphilitic condition, promoting the absorption of the lymph, which is prone to be thrown out, but is at the same time a powerful poison, acting probably on the blood, producing anæmia and tending to a degeneration of the tissues. It must be evident that, either from the nature of the original poison or from some peculiar constitution of the patient, a powerful medicine like mercury may have exerted all its powerful influence, and beyond this have been injurious. If, therefore, a caries of the bone exists, which, corresponding to a true ulceration of the syphilitic kind, exhibits a depression in the centre, with a deposition of new bone around, we know that this will heal in time, and few, I think, will deny that mercury at one time may not be beneficial; but should the caries progress beyond this stage, and lose its characteristics in consequence of some general constitutional disturbance, nothing would be more likely to accelerate its progress than mercury. In a word, I consider that in the true syphilitic caries of the bone presently to be described mercury is useful; but if disintegration commences, above all remedies it would be harmful. The two statements, then, of its beneficial and injurious effects, are not antagonistic; for although there is no proof that mercury has any especial effect on the bones, yet if a destructive caries already exist, no drug is more likely to extend the process. I cannot therefore but think that the observation of experienced men like those I have mentioned, as to the too frequent baneful effects of mercury, must be correct. An objection may be raised by



some in the denial of such an affection as syphilitic caries, or that this is ever witnessed without the administration of mercury; to this it may be answered that, if reference be made to those severe cases of necrosis of the calvaria where large plates of bone are detached, the opinion is no doubt correct; but if it be denied that a caries to a less degree occurs from syphilis alone, the statement must arise from want of experience, for, as I shall presently show, a caries may constantly be found on the cranium when the scalp is removed where no disease, or at most a periostitis, was suspected to exist.

Whether, in the production of other effects observable in the so-called tertiary stage, mercury gives its aid, involves another question, but it may be stated that, in connection with more than one of the lardaceous livers preserved in Guy's museum, it is said that mercury had been largely administered. The patients, however, it must be remarked, from whom they were taken having also had syphilis, there had been a manifest cause for lardaceous disease, without the supposition of another instrumentality to have originated or even aggravated it.

*The peculiar effects of syphilis on the system.*—These, as already said, are characterised in one of their principal features by an exudation of lymph. This may vary somewhat in consistence and form, according to the tissue in which it is deposited, and thus on the skin or mucous membrane it may have a tendency to soften and ulcerate. The oldest observations in connection with such depositions refer to nodes on the bone, due to an exudation of lymph between the bone and periosteum. This node is very inert as regards ulterior changes, although, if not removed by remedies, it may ossify, or, becoming soft, involve the bone in caries. The iris also at a very early period in the history of syphilis was observed to be liable to a deposition of lymph, which underwent a rapid removal by mercury. In like manner condylomata or mucous tubercles were recognised as one of the effects of the virus, and also eruptions on the skin styled tubercular. It was not until a much later period that nodules of lymph were observed to occur in the tongue, and not until a comparatively recent date that they might be found in other muscles of the body. It is now maintained that all these observations related to the external parts of the body only, or those which could be seen,

but that a more extended observation of modern times has shown that the internal parts of the body may be similarly affected.

*Mode of formation.*—The character which the deposit assumes in a muscle may be taken as that which prevails more or less in all other organs. In the tongue or in one of the muscles of a limb a rounded, hard lump may be felt through the integuments, and thus constitutes a tumour. It differs, however, from the ordinary class of tumours, known as new growths, since the latter proceed from a small point or centre, and continually grow on the surface, whereby they become circumscribed and are constituted wholly of the new material which has been thrown out. This is the case in cancer or tubercle. In the syphilitic tumour, however, the exudation appears to have been, in the first place, of a soft and albuminous character, and being poured out in large quantity, has infiltrated the tissue; consequently, when examined, the lymph and the original structure of the part are found incorporated. At a subsequent period, when this has become hard, if a portion be examined by the microscope, the muscular structure will still be found present in the apparently simple, hard, fibrous, mass; and thus it is that, if appropriate remedies be given at an early period, the tissue will be left in its integrity after the adventitious material has been absorbed. This is everyday experience as regards the tongue. In consequence, also, of the lymph being poured out, and not growing from a centre, the diseased mass is not so circumscribed as a new growth, and the lymph or fibre will be found radiating into the muscular tissue around. Thus it is that the surgeon meets with such difficulty in his attempt to remove these tumours by operation; instead of their turning out as an ordinary new growth would do, these have to be actually cut out. If not absorbed by remedies, they become very hard, and then more circumscribed, and remain inert for many years.

In the liver the same process occurs. In this organ the fibroid nodules are not seen, as a rule, until after some years of their existence. They are then hard, more or less circumscribed, but found shooting out their fibrous rays into the surrounding hepatic tissue. In this case, also, owing to the contraction which takes place, there is often left a remarkable

cicatriform appearance on the surface. It is this exudation of lymph or fibro-plastic material and subsequent contraction which peculiarises the disease ; thus in the pharynx and larynx, not only is there an ulceration, but an induration at the edges and base of the ulcer, formed by the same material, and in the case of the larynx, as in the instance I shall presently mention, there may be sometimes found a simple fibroid deposit, without ulceration. In the bone a similar exudation occurs in the canals, and if accompanied by caries, is followed by a similar cicatriform appearance as in other parts. This is often well exemplified on the os frontis of the cranium.

*Structure.*—The deposit which is met with in the liver and other organs has generally had a long existence there before it comes under our notice, and then, when submitted to examination by the microscope, is found to contain fibro-plastic elements, small nuclei, fatty granules, and some amorphous matter. By French and German writers the term gummy tumour is used to designate these syphilitic deposits, but it is a word which I do not adopt, as it would seem to suggest a soft and almost semi-fluid tumour, which is a condition not often met with, except in a very recent stage of the disease ; as usually found, they are hard and fibrous, indicating a dried-up condition of a fibro-plastic matter ; occasionally a secondary softening process may have taken place, and thus in one or two instances the nodules in the liver have been in a semi-liquid state in their centres ; but in the best-marked instance of this which I shall have to mention a question existed as to the genuine character of the deposit, and whether, indeed, it might not rather have been the remnant of a dried-up abscess. On the surface of the body or mucous membranes, however, this softening process does take place, and thus we have caries of the tibia and cranium, or ulceration of the pharynx and larynx.

*Is the syphilitic deposit peculiar and distinguishable ?*—This cannot be answered affirmatively, since no elements possessing any peculiarities are found in it. At the same time, should nodules of fibroid tissue of the kind described be met with in the liver and in other parts of the body, a strong suspicion would be excited as to the nature of the disease ; and should, moreover, they be associated with other conditions usually re-

cognised as syphilitic, the proof of the existence of syphilis would be as satisfactory as that for any other disease. For instance, the elements of tuberculous matter are not so distinctive that a single tubercle in the body is sufficient to indicate its nature ; indeed, should the theory of those physicians be correct, that tubercle is only a modification of inflammatory lymph, it would necessarily require a certain amount or distribution of it, from which a conclusion could be framed. This difficulty, however, in fixing the syphilitic deposit with any peculiar characters, has been considered by some sufficient to discredit its venereal origin, for they have said, why should that be styled specific which presents no other features than those of an ordinary inflammatory product ? In answer to this I would say that, in all probability, time will evolve some distinguishing features in these deposits, but in the mean while I would demand of the doubters whether they disbelieve in the formation of a node on a bone or lymph on the iris because they are unable to point to the peculiarities of the effused products. I think that the changes in one organ are as characteristic as in another ; and thus, if an excavated ulcer, with indurated edges and other peculiarities, is called syphilitic because these are the appearances usually met with in the venereal disease, so in like manner I should say that fibroid nodules in the liver, deposited towards its surface and producing a puckering of the surrounding tissue, are due to syphilis because so frequently met with in that disease. The argument against such a conclusion, taken from the want of any peculiarity of structure, is equally applicable to the syphilitic deposits on the exterior of the body as well as to a large number of other morbid changes in the system.

#### LIVER.

I will speak first of this organ, because it is that which appears to be pre-eminently selected as the seat of the syphilitic formations. It is remarkable that two centuries ago the liver was thought to be affected by the venereal poison, and that since this period more than one writer has alluded to the occurrence of jaundice during the progress of the disease. These, however, were mere surmises, as no mention is made of

any tangible hepatic lesion. Indeed, it is only within the last few years that the subject of syphilitic affections of the liver has been brought before the notice of the profession in England. The first description, I believe, was that given by Mr. Busk, in his translation of Wedl's 'Pathology,' in 1855.<sup>1</sup> So little was it then known, that the author himself appears to have little knowledge of the subject, and gives his information from Dittrich. The latter (Wedl says) has shown that after inveterate syphilis the liver frequently presents a cicatriform tissue on its surface, which may extend deeply into the parenchyma; he has also noticed scattered nodules, consisting, like the cicatriform contracted parts, of connective tissue. These parts are occasionally found in a state of involution, containing an abundance of fat-globules and free pigment-molecules, and when torn asunder also presenting shrivelled nuclei. In the neighbourhood of these fibroid nodules, where the hepatic tissue has already lost its normal texture, irregular clotted masses, in which no further organization has been set up, may be observed. The callous streaks, penetrating the substance of the liver, of lightish-gray colour, consist of many fibrils, occasionally crossing each other, which when treated with acetic acid exhibit elongated, imbedded nuclei, placed at regular distances apart. Besides this, groups of pigment-molecules are very frequently seen, no longer contained in a cell, whilst in many other situations they are still manifestly closed in a tunic.

It will be seen that in the following cases the liver presented generally a number of rounded nodules, placed towards the surface, as above described. They were of different sizes, varying from that of a pea to that of a marble. They were for the most part hard, one or two only showing signs of softening in their centres. When old, they were more or less circumscribed, though sending out branches of fibre into the surrounding tissue. By the contraction which had taken place, a cicatriform appearance had been produced, and thus the resemblance to syphilitic affections of the skin and mucous membrane.

<sup>1</sup> This date will show how recent has been the investigation into this subject and how novel it was to Englishmen. When shortly after this period, I exhibited specimens at a Medical society, considerable scepticism was evinced, and since that time, a reviewer of my published lectures has stated that I should not have spoken of such deposits being syphilitic as received facts.

*The liver in congenital syphilis.*—The same appearances may be found in those in whom the syphilis is congenital, and of these I shall be able to give an example.

It has been stated, however, by Gübler and others, that the livers of infants who have died of syphilis have presented a different appearance; that the fibroid nodules found in the adult have not had time to form, and thus the exudative material is more diffused, it is more acute, and is to be found in a soft or liquid condition throughout the organ. When presented to our notice, this has become firm; but being diffused, the liver is hypertrophied and indurated. It is usually found large, globular, and elastic. I shall, unfortunately, not be able to give examples of this, for since my attention has been directed to this point I have only had an opportunity of dissecting two syphilitic infants, for previous to this time I had only noted the peritonitis and pneumonia which is often found in such subjects. In these two cases the livers were firm, although one contained a considerable excess of fat, and in one of them there did appear to be present some fibro-plastic material. I would not wish, however, from such slight data, to offer anything as a result of my own observation. The condition spoken of, however, seems to have been attested by others, and thus placed on a respectable foundation. Professor Thiry recently exhibited to his class a specimen of this specific alteration, which he said was described by Gübler as affecting the liver in hereditary syphilis, but it will be seen that even here the change was more like what is observed in the adult. The foetus was born dead at the seventh month, and the liver was very hyperæmic. The alteration consisted in the deposition of numerous ovoid, yellowish-white kernels, of varying dimensions. On incision, these presented a nacreous surface, of a fibro-cartilaginous hardness. Under the microscope neither vessels nor nerves were discoverable, some nuclei, nucleoli, and elongated cells, forming the sole elements. It was fibro-plastic tissue in the first stage of development.

This condition is styled by Thiry tertiary syphilis, as it is also by Gübler; but, for the reasons before said, the term is not applicable, secondary or constitutional syphilis being the correct expression; the latter I prefer, as the deposit is not a secondary, but the direct, result of the introduction of the virus. It would

indeed, be remarkable if the child had run through three stages of syphilis in seven months. So great an improbability should make us hesitate to call such a condition tertiary syphilis. Should a foetus be born indeed with tertiary syphilis, I should expect to find a lardaceous liver; but this does not occur, unless, indeed, the indurated liver spoken of by Gübler be an example of it.

*Perihepatitis.*—This, as far as my own observations have gone, is wholly connected with the deposit in the parenchyma, at least I have no evidence that in the adult an inflammation of the serous membrane ever occurs in connection with syphilis without some affection of the tissue beneath. Adhesions may certainly often be found in syphilitic subjects, but there has been no proof that these are of syphilitic origin when no deposit has existed in the substance of the liver itself. It has been thought, however, that they may independently occur.

In three cases, however, of still born syphilitic infants which I examined I found recent adhesions between the liver and diaphragm, and in two of them these were associated with a general peritonitis, just as Dr. Simpson long ago described. In these cases there was no apparent disease of the liver itself, but the microscope was not used in order to ascertain the fact. It is clear, however, that if these children had lived, the adhesions would have remained, and thus in adult life their origin would have been unknown. It would not, therefore, be just to ignore syphilis as a cause of perihepatitis or even of a general inflammation of the peritoneum.

The case which immediately follows is the first in which I looked for the deposit in the liver, after my attention had been directed to the subject. It affords a good example of the disease, and is the case illustrated in the Plate III, fig. 1.

CASE 1 (Prep., liver, 1913<sup>10</sup>; calvaria, 1075<sup>75</sup>; testes, 2351<sup>55</sup>).—Alfred H—, æt. 39. He had led a very dissipated life, had had syphilis, and taken much mercury. The disease of the cranium, for which he entered the hospital, had been increasing for three years before his death, commencing with a slight exfoliation of the bone on the right side, and advancing until a large part of the calvaria was destroyed. He was in the hospital several times for this complaint, and on his final admission was in an extremely cachectic state, and scarcely a sound portion of bone remained on his head, the latter being covered with cicatrices and purulent sinuses. He died shortly after of pleuro-pneumonia.

*Post-mortem examination.*—The surface of the head presented a most remarkable

appearance, from its irregular and flattened shape. The forehead was depressed, from the whole of the bone having gone, the cicatrices of skin being adherent to the dura mater beneath. At the sides were numerous scars and fistulous openings, the latter leading to necrosed bone. On the left side was a large piece of bone nearly detached. The dura mater was more or less adherent, both to the bone and to the integument, where its osseous covering was gone. Brain healthy. The *liver* presented, upon its surface, an indentation like a cicatrix, and upon cutting through this the structure, for a short distance beneath, was seen to be contracted and indurated, from the presence of a dense fibrous tissue infiltrating the parenchyma. Although this puckered part, as a whole, was not accurately defined, yet below, it had a distinct rounded margin, and the new material appeared to have been originally deposited as two rounded nodules. Such nodules were seen scattered about in the neighbourhood, and amounted to about fifty in number. They consisted of round, hard, white masses, the size of peas, and at first sight might have been mistaken for cancerous tubercles; unlike these, however, they were not situated, for the most part, on the surface of the organ, but in the interior, being formed within Glisson's capsule, and thus everywhere in close contact with the portal vessels. These nodules were of a pearly white colour, very firm, hard, and dry; they cut sharply, as cartilage, and did not tear, as fibrous tumours, and they emitted no juice on pressure. The microscope showed them to consist of an amorphous, albuminous, translucent material, which, by the addition of reagents, was seen to have somewhat of a fibrous arrangement, and interspersed with nuclei and fatty granules; in fact, a very low organizable deposit.

The testes were much wasted; a section showed them to be very hard, dense, and fibrous. The true glandular structure appeared to be replaced by a tough fibrous tissue. There were also distinct nodules resembling those in the liver.

In the next case it will be seen that the disease of the liver was associated with the lardaceous change in the kidneys and spleen, and thus affords an example of the combination of the so-called secondary and tertiary stages of syphilis. From what has been already said, there is every reason to connect the state of the liver with the true syphilitic stage, whilst the state of the other viscera is to be regarded as the sequela. This appears to be more correct than to class them all altogether under the vague term tertiary.

CASE 2 (Prep. 1913<sup>26</sup>).—Mary Ann C—, æt. 27, was admitted in a wretchedly cachectic condition. She was a woman of the lowest character, covered with an ecthymatous eruption, and had caries of the clavicle. She very shortly died of peritonitis.

*Post-mortem examination.*—The kidneys and spleen were found affected by the lardaceous disease to an extreme degree. The liver was fissured on its surface, and had throughout its substance a number of white, hard, fibrous masses. These were situated mostly towards the exterior, but some were in the midst of the organ. They were circumscribed, so that they could be turned out of their position, but not wholly so, for a circumference of fibrous tissue still remained, which passed insensibly



into the hepatic structure. They were composed of ill-formed fibre. The gland-tissue was elsewhere healthy.

The next case corroborates the remark made in connection with the preceding case, that the fibroid deposits do not belong to the latest stage of syphilis when the patient has passed into a state of cachexia, since this woman had not suffered from any of the symptoms usually designated tertiary; indeed, she died, as it were, accidentally, and not from the general decay of the tissues, at a period when the fibroid deposits are mostly found.

CASE 3 (Prep., liver and larynx, 1913<sup>30</sup>).—A woman, æt. 33, had had hoarseness and difficulty of breathing for about a year, and which had gradually increased until the day of admission. On the evening of this day, the respiration having almost ceased, tracheotomy was performed. She was relieved by the operation, but soon afterwards emphysema came on, and she died in two days.

*Post-mortem examination.*—The larynx, on examination, was found to be almost closed by a dense mass of fibrous tissue, which occupied the glottis, and which might, with some justice, have been designated a tumour. It was composed of a dense fibro-albuminous tissue, and corresponded to a node on a bone, or nodule in the liver. The independent opinion of two surgeons was unhesitatingly in favour of its being syphilitic. Beneath its posterior surface was a small, longitudinal fissure or ulcer. Many of the cervical glands were enlarged. The liver, on its upper surface, between the right and left lobes, showed the capsule puckered, and of a white colour. On cutting through this there was found a hard mass of fibrous tissue, about the size of a billiard ball. It was tolerably circumscribed, although it penetrated the tissue around, and when cut through appeared to be made up of a conglomeration of a number of smaller nodules.

The following case is interesting, as being that of a child who had never had the so-called primary syphilis. The disease was congenital, but the result on the system was the same as in the previous cases.

CASE 4 (Prep. 1913<sup>35</sup>).—Lucy R—, æt. 12, admitted for scarlatinal renal dropsy, of which she died. She was a small, puny, cachectic child, and had always been ailing. One of the tibiae much enlarged from a chronic osteitis. The mother had had secondary symptoms.

*Post-mortem examination.*—The kidneys were enlarged, and contained a tubular, inflammatory deposit, as in ordinary cases. The liver was adherent to the diaphragm by old adhesions. Its whole surface was puckered in a very remarkable manner by the contraction of fibroid material, which passed into its substance. A section showed a number of deposits, a dozen or more, composed of a firm, yellow, amorphous substance, each about the size of a nut. These were round and circumscribed, and appeared as if they had been larger, but became contracted, as there was much puckering of the tissue around them; the surface was, accordingly, much fissured.

The following five cases are related under their respective heads, but in all of them the liver afforded good specimens of the peculiar deposit.

CASE 5.—This is described under Lung, Case 1, and the Prep. 1913<sup>30</sup>. The liver contained about fifteen or twenty deposits, varying in size from that of a marble to a walnut.

CASE 6.—This is described under Brain, Case 1, and the Prep. seen at No. 2004<sup>50</sup>. The liver was adherent to the diaphragm, and at this part the organ was occupied by some hard, yellow masses, formed of conglomerated nodules ; also some isolated, smaller nodules.

CASE 7.—This is described under Brain, Case 2, and Prep. 1913<sup>40</sup>. The liver contained three or four hard, yellow, fibroid masses, about the size of marbles. These were near the surface, and gave a puckered or cicatriform appearance to the upper edge.

CASE 8.—This is described under Brain, Case 4. The liver contained two or three nodules of a tough, yellow, amorphous substance. One of these, on the surface, had produced a cicatriform appearance.

CASE 9.—This is described under Testes, Case 3. The preparation leaves no doubt of the disease in the latter organ being syphilitic, and it is stated that the deposit in the liver exactly resembled it. Here there was a cheesy mass, partly projecting and partly imbedded in the substance of the organ, on its posterior border.

The following case shows lardaceous disease as the sequela of syphilis, and cirrhosis, as a result of intemperance ; but the case is here given because a question arises whether the amount of fibroid deposits in the liver was not determined in part by the syphilis before the lardaceous change commenced—whether, indeed, more than one cause was not in operation to produce the morbid changes found in this man.

CASE 10 (Prep. 1913<sup>15</sup>).—Thomas H—, æt. 43. He was a coal-porter, had drunk hard, and had for some years been suffering from rheumatism and other effects of syphilis. His health had been bad for six years ; for ten months he had been ill, and quite incapacitated for any work for five months. During this time he had pain in the side and swelling in the abdomen. On admission he was found to have ascites, and both the liver and spleen were enlarged. He was tapped two or three times.

*Post-mortem examination.*—The liver, spleen, and kidneys, were found to be lardaceous, the two latter organs forming perfect specimens of the disease. The liver, besides being similarly affected, was also cirrhotic, that is, there was interspersed through the organ a quantity of tough, fibrous tissue, but this was peculiar in being here and there concentrated into distinct round nodules.

In the present comparatively recent discovery of these changes in the system in syphilis, and when further observation is necessary in order to ascertain if the deposit possess

any peculiarities, it may be sometimes difficult to determine positively whether the affection be due to syphilis or not. Thus, when a patient has been in hot climates, and a low organizable deposit be found in the liver, a question may arise whether this be the remains of a dried-up abscess or an inflammatory exudation which has never reached the stage of pus. As my object is not merely to select well-marked instances of syphilis, with the effects on the viscera, but to take all cases which bear on the subject, I shall give one or two examples of these doubtful cases, so that they may be placed in juxtaposition with the genuine ones which have preceded.

In the case which follows it may be a question whether the deposit in the liver is a result of syphilis or a simple inflammatory exudation associated with the dysentery, and to be classed amongst the well-known cases of hepatitis which are closely connected with the intestinal affection. The case is interesting in another point of view, as showing the occasional consequences of a deposit of this kind—the production of ascites by pressure on the blood-vessels.

CASE 11.—J. W.—, æt. 34, a sailor, and had been in hot climates. He was admitted for ascites and swelling of the legs. This was thought to be dependent on hepatic disease, and he was tapped, with relief; on a second occasion, however, the operation was followed by peritonitis and death. He had scars on the groin, as from old buboes, and also an excavation on the penis, near the frænum.

*Post-mortem examination.*—The liver was found firmly adherent to the right side, and also to the diaphragm above. When the latter was removed from its surface, a quantity of very tough, yellow material was cut through. This substance, which was seen on the surface, penetrated the liver-structure, and occupied a large portion of the posterior part of the right lobe. There was a mass of this substance the size of the fist. It was tough, yellow, and dry, and composed of a number of round nodules of the size of marbles. Some of these were almost isolated, and at a greater distance there were smaller ones, distinctly separated. The most important fact in connection with this adventitious material was its surrounding some of the hepatic veins as they entered the vena cava, and even encroaching on the vena cava itself. Thus, the lower part of this vessel was of the usual size, but as it passed through the liver it was encroached upon, and much diminished in calibre, by the protrusion into its interior of one of these hard nodules. Close to this, two openings of the hepatic veins were seen, one very small and the other closed. The latter was dilated behind the obstruction. In one place there was some of this adventitious substance in Glisson's capsule, running in the course of the portal vein.

In the following case a similar difficulty to that of the last exists. The man had had syphilis, and he died with the lardaceous affection of the viscera, which undoubtedly pointed in

that direction. As, therefore, the results of syphilis were evident in the system, it might not unfairly be assumed that the deposit in the liver was one of them; but as the patient had also had dysentery in warm climates, a doubt arises as to whether the inflammatory deposit in the liver may not have been the consequence of a tropical hepatitis. In the present state of our knowledge, it would be better to leave such a question undetermined.

**CASE 12.**—Thomas R—, æt. 31, a soldier, lately serving in the West Indies. He said he had had syphilis six or seven times, and been salivated five times (?). For nearly three years he had been suffering from cough. He afterwards went to the Crimea, but was soon sent to the hospital at Scutari with dysentery. He afterwards became dropsical.

*Post-mortem examination.*—Left lung disorganized, in consequence rather of a chronic broncho-pleuro-pneumonia than from tuberculous disease. The pleura much thickened, tubes dilated, tissue consolidated by chronic inflammatory deposit, and in the latter were some cavities, lined by a tough, hard membrane. Bronchial glands enlarged. The colon was very irregular and rugged over the whole of its mucous surface, showing that it had been at one time extensively ulcerated, and now healed. Liver was lardaceous throughout, and occupying a large part of it were a number of yellow, amorphous masses, the size of nuts and smaller; their circumference was firm, but centres of cheesy consistence; they appeared to be formed in the course of the portal vessels. Spleen large and lardaceous.

Although attention has only been lately attracted to the syphilitic affection of internal organs, cases where deposits occurred must have been noted previously, and therefore I am not surprised to find that my predecessors, as well as myself, had observed the facts years ago, although ignorant of their pathology. The following case I reported several years since, when unaware of the nature of the morbid changes.

**CASE 13.**—Henry A—, æt. 34, came into the hospital with cirrhosis of the liver. He was a soldier, and had been very dissolute in his habits. He had lost his penis from syphilis.

*Post-mortem examination.*—Head not examined. Heart—mitral orifice much contracted from thickening of the valve; aortic valves adherent. The liver was cirrhotic; it was adherent to the diaphragm, and at this spot, on its upper part, there was a tumour imbedded in the organ itself; it was of fibrous structure, but softer in its centre. The microscopic examination showed it to be composed of fibrillated tissue, fat, and imperfectly formed cells, constituting a low form of inflammatory deposit. Near it there were one or two similar tumours of the same character. The left testicle contained a tumour of exactly similar character to that in the liver, and very firm.

The following case also occurred some years ago, and of which I have a short note.

**CASE 14.**—William A—, æt. 48, had suffered from syphilitic rheumatism and cachexia, so as to be unable to work for two years. Died of pneumonia.

*Post-mortem examination.*—Cranium carious over frontal bone. This bone also much thickened in parts. Abscess around the elbow-joint. Lungs showed recent pneumonia; also a number of small, white, inflammatory deposits throughout these organs, one or two of these softening. Liver contained a few small, white, firm deposits. Spleen contained also one mass of a firm, white, fibrinous deposit.

Not only should old cases which have been well reported be found to resemble closely those recent ones where our attention has been more particularly directed to the subject, but in a good museum, specimens should be preserved exhibiting the changes, even should the collector of them have been ignorant of their nature. Thus, I have felt no surprise in discovering in our own museum specimens which illustrate, I believe, remarkably well some of these syphilitic affections.

The following case will be seen to have occurred nearly forty years ago. The description, I believe, is by Dr. Hodgkin.

**CASE 15** (Prep. 1913, in a preparation showing fibroid nodules in the liver; and 2003, a spleen with similar deposit).—Daniel P—, æt. 34, under Dr. Cholmeley, in 1826, for dropsy and albuminuria. "The liver was healthy, with the exception of two or three puckered depressions on the surface, and imbedded in different parts of its substance were some small tubercles, the largest of which were about the size of horse-beans; they were quite defined, of rather cheesy consistence, and in colour resembled recently melted sulphur. In the neighbourhood of some of these tubercles, as well as immediately under the before-mentioned puckered spots on the surface, there were small, irregularly shaped portions, of a semi-cartilaginous tissue. In the spleen, which was rather large, there was an irregularly shaped, but circumscribed mass, rather larger than a hazel-nut, of a structure which at first appeared to be tuberculous, but which proved to be dependent on a peculiar alteration. The kidneys were of a light colour and mottled, from a degeneration or deposit, as seen in other cases."

There is no history connected with the following preparations, but the two morbid conditions there seen being often associated, and the one so exactly resembling that found in persons the subjects of syphilis, and the other in those who have died from the sequelæ, that there can be little doubt that they well illustrate my subject, and point, the one to the so-called secondary, and the other to the tertiary, effect,—the lardaceous disease, from which the patient died, being the

ulterior effect of syphilis, whilst the nodules found in the liver were the remnants of the effects of the more active virus.

CASE 16.—Nos. 1903<sup>32</sup>, <sup>40</sup>, are two old preparations of portions of the liver, showing in each a firm, rounded mass in the substance, and much puckering of the surface. The hepatic tissue has undergone the lardaceous change.

Connected with the following preparation there is no history of syphilis. All that is recorded is that the man died of erysipelas, arising in connection with a sore on the leg and exfoliation of bone. The disease, however, corresponded exactly with the syphilitic deposits.

CASE 17.—Prep. 1903<sup>40</sup> is a portion of liver containing some fibrous deposit. The organ is described as large, and having within it some white spots, varying in size from that of a pin's head to that of a horse-bean. In the right lobe, extending from the surface to an inch inwards, there was a mass of fibrous structure; and imbedded in the left lobe a similar mass, equal in size to that of a small walnut; the portion of liver surrounding it was indurated and contracted.

The following specimen is an old one, and, unfortunately, has no history connected with it. It is remarkable as being a portion of the liver of an infant, and unlikely to be affected by any of the ordinary morbid changes, and therefore highly suggestive of syphilis.

CASE 18.—Prep. 1912<sup>50</sup> is a small portion of the liver of an infant, in which a white, fibrous tissue is seen permeating it in various directions. There is no history with it.

As just now said, if cases be accurately taken, our records would show instances corroborative of our more modern ones. I have not wished to make this report too lengthy, by selecting every case which might have been brought forward to strengthen the position, but in a casual reference to some old volumes I meet with the following :

CASE 19.—John W—, æt. 56, admitted into the hospital for ulcers on the leg and general cachexia.

After death the liver was found paler and firmer than usual. There was a small, yellow, soft tubercle in the left lobe. The spleen was indented at one spot, and indurated; it resembled in colour new leather.

In the next case which I find recorded there is a distinct history of syphilis, and thus it appears to be a perfect example of the disease.

CASE 20.—Cornelius L—, æt. 27. He was in a very cachectic state, from the

effects of syphilis and mercury. Had eruption on his body, and numerous cicatrices. He died of pneumonia.

*Post-mortem examination.*—On the right side of chest strong and old adhesions, of considerable extent. The bond of union was in many parts about a third of an inch in thickness, of a firm and dense structure, resembling fibro-cartilage, or rather softer (what might, perhaps, be called firm lardaceous). There was also some recent lymph upon it. Old adhesions on the convex surface of the liver. The liver contained a number of round granules, varying in size from that of a shot to a pea. They were of a rounded figure, and though not possessed of a distinct capsule or cyst, might be clearly turned out of the structure in which they were imbedded.

The following case I give on account of the note attached to it by Dr. Hodgkin, although the remarks are obscure. It is difficult to know whether he referred to the fibroid or lardaceous change, but it is clear that he had observed morbid changes in those broken down by syphilis or mercury, and which he seemed to attribute more particularly to the latter.

CASE 21.—Joseph D—, æt. 28, under the care of Mr. Morgan, in 1830. Long labouring under venereal and mercurial cachexia.

The liver was pale and granular, containing little round bodies, which, though turned out easily, did not possess distinct capsules.

*Note by Dr. Hodgkin.*—The same form of derangement I have repeatedly seen in those whose constitution had been impaired by mercury.

The following case is also confirmatory of the previous observations.

CASE 22 is an old preparation of a calvaria (No. 1080), showing large portions of bone exfoliating. It came from Flora N—, a young woman, a patient of Mr. Key, in 1826. She was in the foul ward, with secondary syphilis and disease of the os frontis. She had also nodes on both tibiae, and on left ulna. On post-mortem examination there were found some rather recent pleuritic adhesions, and in the lungs themselves some minute tubercles (?) subjacent to the pleura, but no true tuberculous matter. The liver contained a few dispersed, irregularly rounded bodies, the largest of which did not exceed the size of a horse-bean; they were soft, and were of a more bilious yellow colour than the surrounding parts, from which they were readily separable. Fimbriated extremity of Fallopian tube firmly adherent to ovary.

In the following case it is difficult to determine the exact condition of the liver from the description, but it was probably lardaceous. I quote the case, however, for the sake of again introducing a note appended to it by Dr. Hodgkin, in which he says, "The state of liver in this case is almost peculiar to those who have laboured under a cachectic condition from mercury." If he refers to fibroid nodules, the observation is probably not quite correct; but if reference be made, as it probably

is, to a lardaceous liver, the conclusion, no doubt, is a good one, though left to his successors to more thoroughly establish.

CASE 23 (Prep. 2005<sup>60</sup>) refers to a lardaceous spleen.—Wm. B—, æt. 30, under Mr. Morgan, in 1829, for cachexia, resulting from syphilis and the administration of mercury. There were excavated ulcers on the body. The liver was shrunken, irregular, and connected to the diaphragm. The structure indurated, pale, and thickly pervaded with a substance having a white, hard, tuberculous character, which in some parts had the form of round, defined masses, of size of large pins' heads, but in parts diffused. The spleen was pervaded by numerous minute, translucent bodies. The lymphatic glands were in many parts enlarged.

## SPLEEN.

It will be seen that I present but few examples where a deposit has been found in the spleen; this may arise from the disease being less frequent in this organ, and also from its peculiarities not being sufficiently well marked as to at once determine its nature. I have given, therefore, only those cases where a deposit occurred in the spleen in common with a similar deposit in the liver or testes, and with which, therefore, it could without difficulty be compared.

In these cases, just as in the liver, it is probable that a fibroplastic material may exist in a more diffused form previous to its becoming concrete, but to such doubtful cases I shall not allude, merely relating those where a circumscribed deposit was found near the circumference, with a cicatriform indentation on the surface. (Plate II, fig. 3.)

I do not allude here to the lardaceous spleen, or that condition found in the stage which is called tertiary, or which might with more propriety be regarded as a syphilitic sequela.

In the following case it will be seen that, associated with the deposit in the spleen, there was lardaceous disease of other organs and enlargement of the bones, being an instance where the effects of syphilis had remained, although the sequelæ had taken place upon them—the affections of the bones and spleen pointing to the syphilis, and the lardaceous disease to its consequences.

CASE 1 (Prep., spleen 2004<sup>64</sup>; testes, 2351<sup>40</sup>).—James L—, æt. 41, was admitted, for strangulated hernia, and died soon after the operation. He was in a wretchedly cachectic state, from constitutional syphilis, and which had quite disabled him from work for nearly three years. He was anæmic and sallow, and both tibix were very much enlarged.



*Post-mortem examination.*—The throat was found to have been ulcerated, though now cicatrized. The liver was cirrhotic and lardaceous. It was nodulated from cirrhosis, and at the same time the adventitious fibrous tissue was in considerable quantity, as apparent to the naked eye. The spleen was large, weighing 2½ lbs. The increase of size was due mainly to simple hypertrophy, but at the same time it contained some lardaceous matter and fibrous nodules. The latter were firm, and of a yellowish-white colour, corresponding altogether to similar deposits found in the liver in other cases of syphilitic disease. The testes were very hard, and their normal structure almost completely destroyed by fibrous deposit. The latter was in the form of nodules, and also of streaks of fibre running through the organ. The one was converted almost entirely into this dense structure, the other contained the rounded nodules. In the former the tunica vaginalis was much thickened and adherent.

CASE 2.—This is seen under Brain, Case 1, and at Prep. 2004<sup>60</sup>. Besides the brain and liver being affected, the spleen was adherent to the diaphragm, and at this spot there existed a yellow mass, about the size of a walnut, corresponding in every respect to the similar deposits in the liver.

CASE 3.—In the case described as No. 14, under Liver, there will be seen to be deposits in various organs, and amongst others in the spleen.

CASE 4.—This is seen in Prep. 2003, and is described under Liver, Case 15. A similar deposit to those in the liver was found in the spleen; irregular-shaped mass, rather larger than a hazel-nut.

CASE 5.—In the case described in No. 19, under Liver, the spleen was apparently affected by a syphilitic deposit and contraction.

#### LYMPHATIC GLANDS.

Amongst the earliest structures of the body observed to be affected by syphilis were the lymphatic glands, and the same interest attaches to them as formerly in reference to the character of the original sore, when those in the inguinal region are involved. The modern theory is probably correct, that the enlargement and induration of those glands which accompany the Hunterian chancre is an evidence of the true infecting character of the disease. When, however, the whole system has become contaminated, the glands in other parts of the body may become involved, and especially the posterior cervical; but in reference to this there appears to be some question whether they be not enlarged in consequence of some slight eruption on the scalp. In favour of this view it may often be noticed that, when any irritation of the skin exists, they may be observed to be larger on that side where the cutaneous eruption is greatest. It would seem, therefore, to be a question still to be answered, whether the lymphatic glands are

affected independently of the part whence the vessels leading to them proceed, seeing that, as a rule, these organs are merely involved in the same disease as the neighbouring textures, as, for example, the mesenteric, by typhoid deposit or tubercle, according to the character of the disease in the ileum; or as the bronchial glands are affected by cancer, tubercle, melanosis, &c., according as the lung itself is, or, as in pneumonia, where they are usually found inflamed, or at least enlarged and softened: for this reason I can quite believe that, since the lung may be affected by the syphilitic virus, so also may the bronchial glands, and therefore that such a case as the following, which Mr. Hutchinson brought before the Pathological Society, is an example of it. An infant, aged five months, died whilst affected with a syphilitic rash, and the bronchial glands were found to be infiltrated with a fibrinous deposit.

As before said, with regard to the liver and spleen, I regard the lardaceous enlargement of the glands as a *consequence* of syphilis. This general enlargement of the cervical, mediastinal, lumbar, and other glands, is sometimes found in connection with the lardaceous change of the viscera, and arises from a general cachectic condition accompanying mostly a disease of the bone; but if arising from syphilis, must be regarded merely as the sequelæ, and therefore not directly connected with my present subject.

#### LUNGS.

Should further observations prove that many of the cases of disorganization of the lung known as phthisis originate, not in tubercle, but in a low organizable deposit induced by the syphilitic poison, a very important fact in clinical medicine will have been discovered. There is no doubt that exudations may occasionally be found in the lungs, which resemble in every respect those which have been described as occurring in the liver or other organs, and at the same time it is well known that those persons whose constitutions are broken down by syphilis and debauchery often fall victims to consumption; but to connect these two conditions requires many more observations than we have at present at command. For when the lung is disorganized it is very difficult to ascertain the

character of the material which has been poured out into it and originated the disease ; it may often, indeed, be found to be non-tubercular ; but as low forms of inflammatory product are exuded under so many circumstances, we require that it should present some characters more marked before it can be pronounced indicative of the syphilitic poison.

An almost endless number of cases might be quoted where, in syphilitic patients, induration of the lung-tissue and local consolidation have been found, but it would be presumptuous, in the present state of our knowledge, to connect these conditions directly with the venereal taint. I shall be content, therefore, with giving one or two examples of cases where a simple deposit was found, and which, corresponding in every respect with similar deposit in other organs of the same case, no room for doubt could exist, leaving for the future to discover whether such cases are not more common than is generally believed.

In infants who have died of syphilis a lobular pneumonia is very often found ; it is distinguished by the presence of a number of small white points, scattered through the substance of the lung ; some of these will exude pus on pressure. Whether this is simple lobular pneumonia or specific in its character, I cannot say.

*Pleuritis.*—I say of this as of perihepatitis, that I do not know of it as occurring independently of the pulmonic affection which may give rise to or be associated with it. As with pneumonia, numerous cases could be brought forward of chronic pleurisy in syphilitic patients, but in so common a disease I should not venture to connect it with the venereal poison.

The following case is sufficient to show the fact that deposits of a peculiar kind do occur in the lungs of syphilitic patients. This is shown in the drawing.

CASE 1 (Prep., lung, 1749<sup>60</sup>; liver and larynx, 1913<sup>30</sup>).—Sydney S—, æt. 29, admitted into the hospital with disease of the larynx, and died on the following day. He was a sailor, and had slept at a coffee-house the night before admission, and whence he was brought to the hospital.

*Post-mortem examination.*—The body spare, as if the man had been ill for some time. He had phymosis, arising from cicatrix, and there was also a scar in the groin. There had never been any opportunity of making inquiries with respect to his illness. The larynx and trachea were exceedingly diseased ; the glottis was so œdematous that the passage was nearly closed. Below this the whole mucous membrane was deeply ulcerated, and the walls of the tube much thickened by an

infiltration of fibrous tissue into the submucous structure; a great induration of the windpipe was thus produced. This fibrous tissue was more or less diffused through its whole thickness, and on the external surface of the trachea there was a hard patch of this substance. At one spot within, the thyroid cartilage was bare. The lymphatic glands in the neck were enlarged. The right lung contained a mass of deposit resembling that in the liver. The left lung contained in its upper lobe a similar mass in process of softening, and below this were a few smaller deposits of the same material. The larger deposits were in size about that of a marble, and when cut through were seen to be totally unlike any ordinary inflammation or scrofulous deposit, but consisted of circumscribed nodules of a firm, yellowish, dry substance, corresponding in all particulars to that in the liver, excepting in being less firm. At the side of one of these masses was another one, softening, breaking up, and in process of forming a cavity. This was peculiar, inasmuch as the circumscribed space or cavity formed by this adventitious material also contained within it a part of the softened contents, in the form of distinct layers. The microscope showed these to consist of fibres, exactly resembling those found in the hepatic tubera, and thus widely differing in composition from any ordinary pneumonic or tuberculous deposit, which are formed only of cells and nuclei of various shapes (Plate III, fig. 2). The *liver* was partially adherent to the diaphragm by old cellular tissue. Covering its upper surface were about fifteen or twenty nodules. These varied in size from that of a marble to that of a walnut. Several projected above the surface, whilst others were contracted, and lay below the surface, producing a general puckering of the tissue around. They were of a yellowish-white colour, tough, and of a leathery consistence, quite dry, and emitting no juice on pressure. In two or three the circumference of the tumours was of a translucent structure, and this was evidently the more recent formation, the opaque and yellow parts being probably similar, but undergoing a degenerative or drying change. All these nodules were tolerably circumscribed, and although projecting on the surface of the liver, had considerably contracted the tissue around. At one spot, between the two lobes, a deep cicatriform appearance was produced by the contraction arising from the conglomeration of a group of these small nodules. The microscope showed the structure of these nodules to consist of nucleated fibres and simple fibrous tissue. The denser yellow parts showed less organization, and granules of fat.

The following, though not so good an example as the preceding, was a case in which a very characteristic exudation was found in the lung.

CASE 2.—It is described in Case 4, under Brain, where spine disease resulted from a syphilitic affection of the nerves, and, at the same time, deposits of the usual character were found in the liver and lung. The deposits in these two organs exactly resembled one another.

Amongst our cases there will be found others where mention is made of deposit in the lung, as under Liver, No. 14, but the description will not allow of my speaking of them with any certainty as syphilitic.

I might refer to such a case as that described as No. 7, under Testes, where, with a disease of the testes and larynx, there was also a cirrhosis of the lung; as the two former organs were diseased in consequence of the syphilitic poison in the system, it is possible that the state of the lung might be induced or favoured by the same taint. It will require, however, much further observation to discover whether this fibrous disease of the lung is sometimes produced by the venereal virus. The same remarks may apply to the thickening of the pleura or chronic pleuritis which accompanies it. I might here remark, what I shall have again occasion to repeat, how closely the syphilitic cachexia resembles that of scrofula, and thus the reason why some have ventured to surmise that the scrofulous diathesis is nothing more than a phase of hereditary syphilis. In the case just quoted (No. 7, Testes) (which, although, I believe to be a syphilitic one), it can easily be imagined that the state of lung, combined with that of the larynx and the low organizable material in the testes, might have caused its appellation—scrofulous.

#### LARYNX.

Ulceration of the larynx is commonly spoken of as one of the effects of syphilis, but it is of a peculiar kind. It is characterised by the production of a fibro-plastic material, which is always tending to harden and cicatrize under the curative process. It thus presents marked differences from other forms of ulceration, as, for example, the tubercular, where the ulceration spreads and the surrounding mucous membrane is often highly vascular. In the syphilitic process, when the activity has ceased from the administration of appropriate remedies, a cicatrization takes place, leaving the affected part puckered, hard, and shiny, as no other form of disease produces; the epiglottis may be quite destroyed, as well as a considerable portion of the vocal organs, but the larynx eventually is quite healed, though indurated and otherwise mutilated.

The great peculiarity, however, of the syphilitic affection over any other is in the production of a fibroid material in the affected part, without any necessary ulceration, as in the case given in the drawing, where only one small abrasion, and that

quite recent, existed on the mucous membrane. In this case the upper part of the glottis had become gradually closed by a small nodule or tumour, which corresponded in every respect to a similar deposit in the liver.

It has been surmised that vegetations on the vocal cords may be sometimes due to syphilis, but of this there appears to be at present no good evidence.

The disease of the cartilages of the larynx I regard as one of the sequelæ of syphilis, and may arise from other causes than the venereal affection.

It is needless to give cases of so common a disease as syphilitic ulceration of the larynx, with the various kinds of destruction which may result. I would merely draw attention to such an example as that just mentioned, and given under the heading Liver, No. 3, where the characteristic form of the disease is seen in the production of a hard nodule in the upper part of the tube, and which has almost closed the glottis. (Plate III, fig. 4.)

#### TRACHEA AND BRONCHI.

It was formerly thought that syphilitic disease affected the larynx, but proceeded no further, but modern observation has proved that it may proceed much deeper into the air-passages.

The first case next given shows a remarkable contraction of the trachea, due to ulceration; at the same time the epiglottis is destroyed, and the interior cicatrized in a manner which can leave no doubt as to its syphilitic origin.

The second case is a very similar one, where the trachea is contracted from ulceration. (Plate IV, fig. 2.)

The third case shows considerable thickening of the fibrous structure of the trachea, and is, in all probability, of a syphilitic character.

In the fourth case one bronchus is remarkably contracted, and which was, no doubt, due to specific ulceration. (Plate III, fig. 3.)

CASE 1 (Prep. 1697<sup>50</sup>) is an interesting specimen, showing, without doubt, the effects of syphilis. The epiglottis has been quite destroyed, as well as the vocal cords; but the ulceration had been long healed, so that the upper part of the larynx presents on its interior a hard, irregular, cicatrized surface. Below this the larynx

has its usual calibre, but at the second ring of the trachea a remarkable contraction has taken place, as if a tight ligature had been placed around the tube, and thus its dimensions have been lessened to half its usual size. The constriction has evidently been due to the contraction of an ulcer at this part. The trachea has also some fibrous thickening on its exterior.

The patient, Philip D—, æt. 37, was under Dr. Bright, in 1834, for epilepsy, from which he died. His voice had been affected for nine years. On *post-mortem examination* a cicatrix was found on the scalp, and which was adherent to the bone on the left side. On removing the calvaria the dura mater was found firmly attached to the brain on the left side, and in the adhesions there was some purulent matter.

CASE 2 (Prep. 1697<sup>76</sup>) is a larynx, showing well the effects of syphilis. The under surface of the epiglottis forms an irregular hard cicatrix; and below this, throughout the larynx, the interior is covered with numerous glistening, puckered cicatrices. At the lower part of the trachea the tube is much contracted, evidently from a loss of substance on one side; for here it is deeply indented, and a raised, puckered ridge passes across the interior, which has diminished the calibre to half its size.

William C—, æt. 34, died under Dr. Back's care, in 1834, apparently from fever. It appeared that he had had inflammation of the windpipe, and that he had had swelling upon the head, and an abscess over the clavicle and on the spine of the scapula. The *post-mortem examination* showed a small portion of one parietal bone diseased. The lungs were healthy, with the exception of one having a portion, the size of a walnut, consolidated by pneumonia.

CASE 3 (Prep. 1718<sup>73</sup>).—Jessie B—, æt. 46, admitted for bronchitis and disease of the liver; the difficulty of breathing was very great, indicative of more than usual mischief in the larger air-passages. She was an intemperate, dissolute woman, but no inquiries were made respecting syphilis.

*Post-mortem examination.*—The trachea was found to be most extensively diseased. The whole of the tube, from just below its commencement, was ulcerated; the interior presented a raised, flocculent, ragged surface, and the same condition extended into the larger division of the bronchi. On removing the tube it was seen that its whole thickness was involved, and infiltrated with adventitious matter. On the anterior surface, between it and the aorta, there was a tough, fibrinous exudation, closely adherent to the rings; amongst this was some softer, yellow material, and which was the same substance undergoing degeneration. It appeared thus as if a chronic inflammatory disease had involved all the walls of the trachea, resulting in the deposition of this tough, adventitious material on the external surface, and ending by ulceration within. A very careful examination failed to discover any products resembling carcinoma or tubercle. In the middle lobe of the right lung there was a mass of consolidated hepatized tissue. Liver cirrhotic and nodular.

CASE 4 (Prep. 1718<sup>73</sup>).—Charles H—, æt. 32. He was a very intemperate and dissipated man. He said he had had venereal complaints several times, and had taken mercury. He was in a very cachectic condition, and had long suffered from laryngitis; he frequently had attacks of difficulty of breathing, so that on one occasion the house-surgeon was forced to perform tracheotomy. He, however, survived only a week after the operation. On *post-mortem examination* it was found that death was due to a general inflammation of the air-passages. The upper part of the

larynx was swollen, altered in shape, and suppurating. The *right bronchus*, just above its division into the secondary branches, was constricted to rather less than half its usual calibre; this constriction was not equal all around, but was caused by the falling in of the sides and back part. A careful examination was made, in order to discover if the contraction was due to any external pressure, but none was discoverable, the only unusual appearance being a small quantity of fibrous tissue around the part, as if an inflammatory action had once existed there; there was also a partial loss of the cartilaginous ring at the seat of contraction, and thus the tube could be easily bent double. The bronchus was somewhat dilated below the affected part. The liver was lardaceous, and the kidney in an early condition of granular degeneration.

#### THYMUS GLAND.

I mention this organ merely because Dubois has stated it to be affected in hereditary syphilis. It is said that the gland presents no changes externally, but when incised and squeezed small drops of a semi-fluid matter, like pus, escape. In the few cases of infantile syphilis which have come before my notice for dissection I did not perceive anything remarkable in the organ, but at the same time I should state that it was not minutely examined.

#### STOMACH AND INTESTINES.

Of the syphilitic affections of these organs I can say but little, as I have no cases sufficiently well marked to warrant their appearance in this essay. It has, however, from time to time been surmised that the intestines might be affected in the venereal disease, and, indeed, several years ago M. Cullerier called attention to the subject of syphilitic enteritis manifesting itself in the form of submucous gummy deposits, which do not go on to ulceration, but induce obstinate diarrhoea and the symptoms of enteritis. He had observed it most frequently in children, but also in adults. It was a disease which required the most delicate appreciation, as the mercurial treatment is far from being contra-indicated, constituting, indeed, the means of cure. Should the observation be correct, a more close dissection will be required in syphilitic infants.

I shall merely be able to allude to cases where patients, the subjects of syphilis, had ulceration of the bowels, but whether dependent on the virus must be received with hesitation.



The only cases I can positively connect with syphilis are those instances of ulceration of the rectum where the disease has extended inwards from the external parts. These cases have more especially occurred in women where an extensive ulceration of the genital organs has occurred, so as to involve the surrounding parts, and finally the rectum. Accompanying the ulceration of the mucous membrane, there has been an inflammation of the pelvic cellular tissue, and thus some contraction or stricture of the rectum has followed.

**CASE 1.**—Sarah N—, æt. 37. She had been a prostitute, and had suffered from extensive sores and condylomata about the anus. She was admitted with ulceration of the rectum, with fistulous openings around. She was in a very cachectic condition.

*Post-mortem examination.*—All the organs in the pelvis were found firmly united together, and the pelvic cellular tissue converted into a dense substance. It appeared as if the external inflammation had proceeded upwards around the rectum, and thus the ulterior change had occurred. The mucous membrane within was also greatly diseased; several ulcers, with bands of mucous membrane, were seen. Passing across and beneath, there were fistulous openings, two of which passed into the vagina. The outlet of the rectum was surrounded by raised edges of thickened skin and condylomata and cellular tissue around, of great density. Liver very large, and compounded of the fatty and lardaceous change; kidneys granular, and occupied by lardaceous deposit. In the lower part of the upper lobe of the right lung there was a round mass of hepatized tissue, softening into an abscess in its centre. There was thus a circumscribed cavity, surrounded by hepatized lung. No disease in any other part.

**CASE 2.**—Elizabeth L—, æt. 31. She had had old-standing inflammation and ulceration affecting the genital organs, with great enlargement of the labia, and for two years had suffered with stricture of the rectum. The passage was very narrow, and the mucous membrane irregular. A large mass of hypertrophied labium was removed a short time before her death.

On *post-mortem examination* it was seen that a very old pelvic cellulitis had existed; the rectum was contracted; the muscular coat much thickened, and cellular tissue around greatly indurated. The mucous membrane was very irregular on the surface, the consequence of a former extensive ulceration.

**CASE 3** (Prep. 1867) is a case of stricture of rectum, following ulceration. A young man who was the subject of syphilis became affected with dysenteric symptoms, and subsequently stricture of the rectum. Finally an abscess formed near the crest of the ileum, which was opened, and found to communicate with the intestine. On *post-mortem examination* cicatrices of old ulcers were found in the sigmoid flexure, and at its lower part it was much constricted. A little above the anus the gut was considerably thickened and indurated. It had an uneven surface; the mucous membrane appeared to have gone, and the subjacent tissue much thickened.

## PHARYNX AND ŒSOPHAGUS.

The condition of the syphilitic ulcerated pharynx is well known—the deep excavations and hardened borders, leaving an indurated cicatrix when the ulcer has healed, so that, as in a woman who was lately in the hospital, the pharynx was contracted to the size of an ordinary sized catheter: or sometimes the velum is bound down to the back of the pharynx. The ulceration need not, however, stop here, but may reach to the Œsophagus, and thus, as in the annexed case, a contraction may exist at the commencement of this tube. (Plate IV, fig. 1.)

CASE (seen at Prep. 1784<sup>95</sup>).—The specimen shows a contraction at the lower part of the pharynx, where it joins the Œsophagus. It is considerably puckered at this part, where evidently an ulcer had existed, and the submucous tissue beneath is somewhat indurated. Some of the neighbouring cervical glands appear enlarged and hardened.

## KIDNEY.

I can offer no cases in illustration of syphilitic disease of the kidney, although such have been described. It may be that instances may not have been unobserved, but that they did not present sufficient peculiarities to warrant any surmise as to the specific origin of the disease. For example, depositions of a fibro-albuminous material, with accompanying cicatrices, are common enough, but further observations would be required to connect them with the syphilitic condition.

The lardaceous or waxy kidney, as before said, so often met with in the so-called tertiary syphilis, I regard merely as a sequela.

## MUSCLE AND HEART.

The existence of syphilitic nodules in the tongue has been recognised for a long period, and in other muscles of the body for several years. As before described, an infiltration of lymph takes place in the muscle, and which, if in large quantity, produces a nodule more or less circumscribed, but never so

defined as a new growth commencing from a centre. Thus it is that the fibrillæ of the muscles may still be found within them when submitted to microscopic examination; and when absorbed by the action of appropriate remedies, the original tissue may be left without much damage having occurred to it. Thus it is also why, in the attempt to remove such tumours by the knife, the surgeon experiences so much difficulty in endeavouring to isolate them. These nodules may be found occasionally in all the muscles, but they appear to arise more frequently in the forearm and leg; in children they are sometimes met with in greater number, when, if they soften, they leave sores on the surface. The sterno-mastoid muscle may be sometimes found to have one or two nodules of the kind in it; but whether the peculiar induration of the whole muscle sometimes observed in new-born infants is of a syphilitic origin, I cannot say. In the few cases of the latter kind which have come under my notice, there has been no other evidence of a venereal taint.

*Heart.*—One of the most interesting seats and, above all, the most important, for such deposits is the heart. A sufficient number of cases have now been recorded to prove indisputably that the heart may be thus affected. I have in the present series no authenticated case of this, but have two or three instances where the condition of the tissue of the heart so much resembled what is seen in other muscles, that I think they, in all probability, constitute true examples of the disease, especially as they could not be connected with a rheumatic inflammation. The latter or rheumatic form of myocarditis is very seldom unattended, as far as my experience has gone, by remains of an old pericarditis or endocarditis, and the condition of the muscle itself shows a streaking by fibrous tissue or a fibroid degeneration of the muscle, rather than a mass of fibro-albuminous material in the walls of the heart, as seen in the present examples.

*Pericarditis.*—With affections of the muscle of the heart, the pericardium is liable to be inflamed, but I know of no independent pericardial inflammation which can be styled syphilitic.

In the following case I strongly suspect a syphilitic origin for the disease, as the appearances were not only like those pro-

duced by the venereal taint, but were altogether dissimilar to those caused by rheumatism. (Plate IV, fig. 3.)

CASE 1 (Prep. 1396<sup>70</sup>).—A. B—, æt. 23, a cattle-drover; whilst driving a beast in the streets, he fell dead. He gasped two or three times, and then ceased to breathe. The body was said to be healthy, as well as all the viscera, excepting the heart. In this a large tumour was found growing in the septum of the ventricles. The organ was of the usual size, the cavities well proportioned, and the muscular walls of natural thickness. The growth projected more towards the right side than the left side, so that, upon looking into the ventricle, no tumour could be seen, the only trace of disease being a thickened patch of endocardium beneath the aortic valves, where the partition is merely membranous. Upon opening the right ventricle a considerable projection was seen to occur from the protrusion of the septum into it, the latter presenting a convex instead of a flattened surface, and having, in fact, a general parallelism with the anterior wall; the ventricular cavity had thus somewhat a semilunar shape. The growth occupied the upper half of the septum, commencing above, at the base of the ventricles, and reaching as low as its centre. Its greatest point of protrusion was just below the pulmonary valves, where it pushed forward the inner curtain of the tricuspid, and considerably diminished the calibre of the ventricle at this spot. This was immediately detected by placing the finger in the pulmonary artery from above, when it was found to pass with facility through the valves, but met with an impediment immediately below from the protruding septum, and which only barely allowed the point of the finger to pass to the ventricular cavity below. On making a transverse section through the septum the growth, as before said, was seen to occupy its upper part; its circumference was so blended with the muscular tissue around that no accurate measurement could be made; but upon being handled, the whole bulk of the tumour was felt to be about the size of a billiard-ball, the centre or focus of the deposit being about midway between the front and back part of the heart. Here the adventitious tissue had quite taken the place of the muscular, but on the circumference was blended with the wall of the heart, so that the muscle was seen streaked with the fibrous tissue. It was an inch in diameter, very dense, and cut crisply with the knife. Where interspersed with the muscle, it was very tough, and could only be torn out in shreds, whilst in the very centre of the mass the structure was softer, and could easily be detached in small pieces. The whole growth consisted essentially of a dense, glistening, albuminous material, more or less fibrillated, and having in different parts various proportions of nucleated fibre, and of a homogeneous, translucent substance. The toughest part interspersed with the muscle consisted almost entirely of a fibrous structure, through which were scattered nuclei, and which, on further examination, was seen to be composed of nucleated fibres and of ordinary areolar tissue. Towards the centre there was less of this organized structure, but, in addition, large plates of a homogeneous, translucent material, and in certain spots, which were yellowish and softening, the same constituents were seen broken up, covered with granules, small particles of fat, and irregular-shaped nuclei. The whole structure was dry, yielding no juice.

The following case, with specimen, was sent to me by Mr. Nisbett. There is no history of syphilis nor any of rheumatism,

and therefore the case stands simply before us as one in which a general experience must suggest the most probable cause of the disease. It appears that the patient suffered from cardiac symptoms from childhood, and therefore, if the disease be of specific origin, the syphilis must have been congenital.

CASE 2.—Charles F., æt. 29, a waterman at Gravesend, and died suddenly, without any previous illness. On inquiries being made, however, it appeared that, from a very early period of childhood, he had been subject to attacks of fainting, and these had been of frequent occurrence until about four years before his death, when they were less constant, and occurred only on occasions when he was excited by drink. He had always been a hard-working man, and accustomed to carry heavy loads; he occasionally had severe momentary attacks of pain in the left side of the chest, but no dyspnoea nor palpitation.

A *post-mortem examination* was made, and the heart sent to me for an opinion. The organ was of usual size and proportions, and the cavities of ordinary dimensions and thickness. On laying open the right ventricle and pulmonary artery, the muscular wall was seen to be replaced by a solid, tough mass of fibrous tissue. This commenced about the middle of the ventricle, and gradually increased towards the base, where the section was an inch thick. The same condition continued upwards, but with diminished thickness, along the pulmonary artery, ceasing at its bifurcation. This dense fibrous structure was thus thickest at the base of the heart, and gradually diminished in amount and thickness, both downwards to the centre of the heart and upwards to the pulmonary artery. It extended laterally to the breadth only of the ventricle, not at all encroaching on the left side. The adventitious material was thus tolerably circumscribed, and there was no fibroid degeneration nor streaking of any other parts of the muscular substance.

Looking with the light of modern science, such a case as the following, taken from the shelves of our museum, suggests a syphilitic cause as a very probable origin for the disease.

Prep. 1397 is a heart showing an albumino-fibroid deposit in the walls of the left ventricle and other parts. The preparation is a very old one, and came from a patient of the first Mr. Forster, and who was in the hospital for a so-called scrofulous disease of the sternum. He died suddenly, and the deposit in the heart was thought to be of a scrofulous character. It may have been the result of a rheumatic carditis, or connected with syphilis in other parts of the body.

#### BLOOD-VESSELS.

I cannot speak with much certainty concerning several other structures of the body as regards the effects of syphilis upon them, but I have much reason to think that the blood-vessels may be affected, although I am not aware that any facts have been published by others on the subject. When, for instance,

a young person, the subject of syphilis, in whom a disease of the blood-vessels is not liable to occur under ordinary circumstances, has a well-marked morbid change in these structures, a strong suspicion is created as to its connection with the taint with which the patient is affected. As, however, such conclusions are equivocal, I will merely give one instance out of many.

I might also have mentioned the case of a prostitute suffering from syphilis, in whom an abdominal aneurism occurred, a form of disease very uncommon in a young woman; also some other cases which I have witnessed, of cerebral disease in young syphilitic subjects due to disease of the blood-vessels, and also some others, where the disease was not fatal, but where the symptoms could be more readily accounted for by a softening than by the inflammatory deposits of which I shall presently have to speak.

If it be true that the blood-vessels are liable to be affected by the syphilitic taint, it will be probably found that the change is not of the atheromatous kind, but rather of the fibroid character, exemplified by a thickening of the coats of the vessels and the proportional diminution of their calibre.

I give the following case in illustration of these suggestions. It occurred before my attention had been especially drawn to the subject, and therefore it is possible that, in connection with the adhesion of the liver and spleen spoken of in the report, some deposits of an adventitious material might have existed in those organs likewise.

CASE 1.—Caroline M—, æt. 38, was admitted into hospital in an almost unconscious state, being roused with difficulty, and having at the same time hemiplegia of the left side, including the face, with the left pupil dilated and the eyeball prominent. Five years before, she had contracted syphilis, and since this time she had been suffering the various constitutional symptoms of the disease. It was said that, five weeks before admission, having previously complained of pain in her head, she had a fit, followed by weakness of the left side. The latter increased, and three weeks afterwards she had another fit. For several days she had been almost insensible, and quite helpless. During the four days she survived her admission to the hospital she lay in an unconscious state, with stertor, &c. The face was covered with a copper-coloured syphilitic eruption, and the legs had numerous scabs of ecthyma.

*Post-mortem examination.*—Calvaria very dense and heavy. Membranes and surface of brain healthy. On opening the ventricles the seat of disease was seen to be in the right corpus striatum and thalamus opticus; a slight depression was seen at their point of junction, and on incising them a soft part was found beneath it.

The softening extended to a less degree for some distance around, and the microscope showed abundance of granule-masses. The *blood-vessels* of the brain were remarkably diseased, not by the usual atheromatous or earthy patches, involving a large portion or entire circumference of the artery, but by the deposition of numerous hard, round grains, which had been formed in their coats, and projected like so many tubercles, both within and without the vessel. This caused them to be of very unequal calibre, and in some places very much contracted. This was the case in the larger trunks of the vertebrals and carotids, but more especially in their branches. They contained no coagula, and did not appear diseased more on one side than the other.

The liver and spleen were firmly united to the diaphragm by old adhesions.

#### BRAIN AND NERVES.

Of all the organs affected by syphilis, the brain is that which, above all others, leads to the most serious results when implicated. It is the organ, however, in which the exact changes which occur have not yet been fully investigated. Those who have written on the subject have spoken of tumours or deposits occurring in the brain, similar to those which are seen in the liver, testes, and other organs. I cannot, however, bring forward any example in which I have found an unequivocal independent deposit in the brain substance; in all my cases the new material has been on the surface, and involving the membranes. Instances have occurred to me where the symptoms could hardly be explained except on the supposition of a deep-seated affection, and therefore I am quite prepared for the discovery of such internal deposits as have been described; but at present, as my object is only to publish a practical and personal experience, I have no opportunity of referring to any other class of cases than those I have mentioned. Fibroplastic tumours are undoubtedly frequently met with in the brain, but in none which I have seen has there been a sufficiently good history of syphilis to warrant their admission into the present series.

All my own cases of undoubted venereal origin, where a post-mortem examination has taken place, have been very uniform in character; the surface of the brain and membranes have been united by a firm exudation, similar to that which is met with in other parts. The neighbouring bone is not necessarily affected, although this has always been the supposition until very recent times. It being an altogether modern obser-

vation that the internal organs were affected in syphilis, it was thought that if brain symptoms existed in a venereal patient, that there necessarily existed an internal node on the bone or an exostosis pressing on the brain. Such, however, need not be the case, the condition found being, as I have said, an exudation between the brain and membranes; and if the bone is affected, it is by caries, and not by exostosis.

Since the conditions found in our cases are so much alike, it is not remarkable that the symptoms in all have had a resemblance. It is well known that old adhesions of the membranes to the surface of the brain give rise to epileptiform fits, and thus it is that in these syphilitic affections of the brain epilepsy is generally the most prominent symptom, though, of course, combined with other phenomena, denoting that the brain substance is involved as well as the nerves proceeding from it. In one or two cases, where paralysis also was present, and recovery took place under appropriate remedies, it was surmised that deeper portions of the brain must have been involved.

The majority of cases which have come under my own notice have been of the following kind. The dura mater intimately united to the brain by adhesions of the serous surfaces, and this, not by cellular tissue, but by a hard, yellow substance, sometimes of great consistence, and destroying or involving the cineritious matter or encroaching on the medullary. In some cases the dura mater was externally adherent to the bone, and the latter was carious. (See Plate II, fig. 2.)

A question arises, in what tissue or part of the cerebral structures does the deposit or exudation first arise? When the bone is affected, it is very probable that this may be the starting-point, and the contiguous membranes then take up the action. When the skull is not involved, it is probable that the process first commences in the arachnoid, and that here the deposit is thrown out. If this be the case, it will account for the rarity of the exudation in the brain substance; and it may be further remarked that in the case of the liver and other organs the deposits are all towards the surface, and, as far as I have observed, their capsules have very seldom been free.

It is worthy of remark, however, that writers on syphilitic diseases of the brain have spoken of cases where they must have supposed that the cerebral tissue itself was affected, as evinced



by aberration of mind or actual insanity, or by various paralytic and other nervous symptoms, which were cured by remedies. Few cases have been published where adventitious matters have actually been discovered in the brain substance; but if such are liable to occur, it can well be conceived that these would scarcely be visible in a case where the symptoms were no better marked than by slight mental derangements.

It has also been surmised that chronic hydrocephalus in children may sometimes have a syphilitic origin; of this I have no case to warrant the statement, although it is, no doubt, true that in puny children, from whatever cause the cachexia may arise, there is often, with other changes in the body, an increased effusion in the ventricles of the brain.

I shall be content in the present essay to present the reader merely with my own cases.

The *nerves* may be involved in a similar adventitious material as that found on the surface of the brain, either independently at their source or from being implicated in the cerebral disease. I have no case exhibiting an independent affection of the nerve in its course and at a distance from the centre. I shall briefly allude to a case of neuroma, where the nerves of the whole body were affected, because of its occurrence in the person of a prostitute, but there was no history of syphilis; nor am I aware that in any similar instances any suspicion of syphilis has existed. The case, however, is interesting in reference to the probability of death being caused by the neuroma of the pneumogastric nerve; and therefore, if such might arise from syphilis, it shows that there is a second mode in which disorganization of the lung, or phthisis, as it is generally called, may be brought about in venereal subjects.

It will be seen that in the following cases an adventitious matter existed on the surface of the brain, exactly corresponding to that in the liver and other organs.

CASE 1 (Calvaria, 1076; spleen and liver, 2004<sup>50</sup>).—Francis W—, æt. 38, was admitted into the hospital in a fit. It appeared that, ten months before, an abscess appeared on the head, having been preceded by much pain, and, ever since, a discharge had occurred from the part. Four days before admission he had a fit, followed by a temporary partial paralysis of the right side, and others had followed since. When he had partially recovered it was found that his right side was weak, and that he had sinuses on the scalp, leading to necrosed bone. Three days afterwards he had several other fits, and therefore Mr. Bryant exposed the cranium,

trephined it, and removed some dead portions. The dura mater was seen covered with granulations of lymph. No more fits occurred during the following two months, and the man was altogether better. Then again the fits reappeared, and he finally died from pyæmia.

*Post-mortem examination.*—The calvaria was found carious around the trephine hole, and the scalp was adherent to it by a yellow, tough material, exactly corresponding to that found in the liver. On the opposite side the dura mater was adherent to the bone by a like deposit, and on tearing it away some purulent matter escaped. The under surface of dura mater was, in like manner, adherent to the brain. The liver was adherent to the diaphragm, and at this part the organ was occupied by some hard, yellow masses, exactly similar to what have been found in cases of syphilis. These were rounded nodules, conglomerated together. At some distance from them there was another nodule, quite isolated. The spleen was large and adherent to diaphragm. At this spot there existed a yellow mass, about the size of a walnut, and corresponding in all respects to those in the liver. The mass consisted of an opaque yellow substance, mixed with other of a translucent appearance. These were composed of fibre, homogeneous material, and fatty granules.

CASE 2 (Brain, 1587<sup>20</sup>; liver, 1913<sup>40</sup>).—Sophia W—, æt. 31. She was a woman of low character, and it was believed that she had had syphilis. It was also said that she had received a severe blow on the head when a child. Four years before her admission to the hospital she had an attack of jaundice; she afterwards (it was said) had a nervous fever and pains all over her. Two years afterwards her sight began to grow dim, especially that of the right eye; and she then had giddiness, followed by fits. These fits were not frequent, a month generally intervening between them. When admitted she was almost blind of both eyes, she had paralysis of motion and of sensation on the right side of the face, and she also had paroxysms of pain in the head. The pupils were dilated, and the cornea of right eye ulcerated. She had one fit while in the hospital, took to her bed, and gradually wasted away.

*Post-mortem examination.*—The calvaria was adherent to the front part of the dura mater, and had to be forcibly detached. On examining the interior of the bone, it was slightly roughened where adhesions had existed, but there was no independent disease, nor could there be found any trace of previous injury. At the anterior fossa the dura mater was united to the bone by a firm, yellow lymph; here also the bone was slightly roughened, but was not carious. The dura mater on the inner side was firmly and inextricably united to the anterior lobes of the brain, especially on the right side, and corresponding to the anterior fossa of the skull. On attempting to separate them a quantity of hard, yellow material was seen uniting them together. This filled up the sulci, and involved the cineritious substance. On the right side it had penetrated to the medullary matter, and here the adventitious substance formed a tumour, tolerably circumscribed on its deep side, the size of a walnut. There was thus a much greater quantity of this material between the dura mater and brain, than between this membrane and the skull, but there was an abundance of it on the petrous bones and in the cavernous sinus. The nerves, therefore, taking their exit from the skull were surrounded by it, including the orbital as well as the optic and fifth on the right side. These nerves were matted together by this hardened, yellow lymph.

The liver contained three or four hard, yellow, fibrous masses, about the size of marbles. These were near the surface, and gave a puckered or cicatriform appearance to the upper edge; kidneys undergoing granular degeneration.

*Lungs.*—The right contained along its anterior border some solid masses of inflammatory deposit. Some of these had broken up into small, suppurating cavities; other parts were infiltrated with a gelatinous, inflammatory material. It did not present any appearance to the naked eye different from the ordinary products found in disorganizing processes in the lung.

In the following case it will be seen that the patient was said to have received an injury to the head, and thus a question may arise as to the cause and nature of the product found on the brain; whether it was simply inflammatory—arising from a blow—or syphilitic, having a constitutional origin? Although, as before said, it is probable that a distinguishing mark may be found between a simple inflammatory exudation and a syphilitic one, yet in the present state of our knowledge we can only be guided as to this distinction by other reasons than those founded on the characters of the material itself.

**CASE 3.**—John D—, æt. 30, admitted to hospital for stricture. He had had venereal disease, and now, besides the stricture, had an ulcer on the leg, with periosteal inflammation near it. Whilst in the hospital he had a fit, and falling on the fender received a scalp wound, and it was then learned that he had had one or two fits previously. On inquiring about an injury to the head, he said that, three years before, he had been thrown out of a cart and struck his head, but had not suffered with his head until lately. His bladder was punctured per rectum, and he left the hospital, but the epilepsy became more aggravated, and he was again admitted some months afterwards in an insensible state, and with a constant succession of fits, which lasted until his death.

*Post-mortem examination.*—The only scar found on the head was that received in the hospital, when he fell in a fit. The calvaria was thickened over the front part, and especially on the right side; here, within, it was slightly elevated by little nodules, indicative of a former osteitis. The dura mater was not adherent to the bone, but was thickened over the frontal region, and here it was closely adherent to the anterior lobe of the brain on the right side. The attachment was so strong that on attempting to remove it the cerebral substance was torn. The latter was involved, so that the cineritious structure was replaced by a yellow inflammatory material. Liver and other organs healthy.

The following is a case of great interest, as it would appear from the symptoms that the disease commenced on the root of one of the spinal nerves.

**CASE 4.**—Mary W—, æt. 53. Was taken into the hospital on account of a numbness and loss of sensation over the right hip, especially along the crest of the ilium. She had no outward signs of syphilis, and the subject was not mentioned to her, as she was thought to be labouring under almost a monomaniacal idea with respect to it; her constant complaint being that her body was ruined by syphilis, which had been given to her by her husband. This feeling of numbness continued until the

leg on that side began to get weak, and subsequently, the other leg became affected. Soon afterwards a complete paraplegia ensued, with all the usual consequences in retention of urine, &c., and from which she died.

*Post-mortem examination.*—Brain not examined. Spinal cord—in the lumbar region on the right side there was a hard deposit, three quarters of an inch in length. This involved the posterior roots of the nerves, to which it was closely adherent, as well as to the spinal cord. It formed a lengthened, irregular mass, and in bulk was altogether about the size of a nut. When cut through, it was found to be composed of an opaque yellow, amorphous substance, like dead or degenerated lymph, and resembling the similar material in the liver. The liver contained two or three nodules of a tough, yellowish, amorphous substance; one of these, on the surface, produced a cicatriform appearance. The lung contained a few hard, yellow masses, which corresponded in all particulars to the similar deposits in the liver.

The following case shows that a deposit may occur within the cranium, involving the roots of the nerves, independent of any disease of the bones themselves.

CASE 5.—Caroline J—, æt. 30. Was admitted under Dr. Addison into the clinical ward for paralysis of the face. She was a prostitute, and had been in the hospital before for syphilitic symptoms. She said that she had suffered a long time from pain in the head, and this at last became so severe that six months ago she went to St. Thomas's. The pain was then fixed at the back and side of the head. Thinking it might be neuralgic, three teeth were extracted, but without relief. She was seven weeks in the hospital, and states that she was delirious and insensible for seven weeks. After leaving, the face became numb, with some loss of power, and then she came to Guy's. It was then found that she had lost sensation on the right side of the face, except at one spot opposite the mouth, where the anæsthesia was not complete. She could not feel on that side of the tongue, nor was there any sense of smell; also power of mastication imperfect. The pain in the head had somewhat abated at the original spot, but had become more general. After this, paralysis of other nerves came on, as all those of the orbit, the eyeball becoming immovable, with ptosis and ulceration of the cornea. Under the use of remedies she then became better, and on leaving, three months afterwards, she could open the eye partially, move the eyeball, and lost the pain in the head. She remained at home for two months, when she again entered St. Thomas's, where she died suddenly soon afterwards.

On *post-mortem examination* several small tumours were found at the base of the brain, enveloping the nerves, and some deposit also between arachnoid and dura mater. There was one compressing the fifth nerve; another tumour was growing from the third nerve, and thus accounting for the several symptoms observed during life. The tumours were gray and hard.

The following is the case of neuroma before alluded to; there was no history of syphilis, nor any very good reason to suppose that the enlargement of the nerves was due to it. It is interesting, however, on the supposition that disease of the lung was thereby brought about.

**CASE 6.**—A woman, *æt.* 25, of dissolute habits, died in the hospital of phthisis. After death the whole of the nerves of the body were found affected by neuroma, or enlargement of the nerves, due to a deposition of a fibre-albuminous material in them. This condition of the pneumogastric nerves was supposed to have given rise to the disorganization of the lungs, which contained no tubercle.

In looking through our old preparations, I meet with the following, which strongly suggests a syphilitic origin for the disease in the brain.

**CASE 7** (Prep 1584<sup>30</sup>, portion of brain, with membranes adherent).—Elizabeth S—, *æt.* 50, a night-nurse, in 1828. For two years she had been subject to considerable pain in the head, and during this time also to fits resembling those of epilepsy. For a few days before her death she had repeated fits of tremor and loss of speech, but continued sensible.

*Post-mortem examination.*—On the anterior part of the right hemisphere the two surfaces of the arachnoid were closely and firmly adherent to each other. There were at this part several small granulations, which appeared to have their seat immediately beneath the arachnoid lining of the dura mater; these tumours, some of which adhered to the brain, were scarcely so large as peas. The liver contained two white tubercles on its surface.

I have already said that in the fatal cases the disease has been found on the surface of the brain, but in some which have recovered the symptoms have indicated a deeper seated change. Such a case is the following, where paralysis coexisted with epilepsy, and therefore suggestive of a very grave lesion of the cerebral structures. A temporary hemiplegia is often seen to occur in epilepsy, but a persistent one, as in the annexed case, appeared to show more than the usual cerebral derangement of this disease. The cure, under iodide of potassium, is one of the most remarkable that I have ever witnessed.

**CASE 8.**—Robert C—, *æt.* 36. He was a carpenter, but formerly had been a soldier in India, and was invalided, owing to rheumatism or pains in his limbs. Two months before admission he had a fit whilst walking in the street, and on recovery he felt his left arm and leg numb and weak. He has had about a dozen fits since, and in some of these he has not lost his consciousness, but he foamed at the mouth and bit his tongue. Two days before admission he had a fit, followed by a great loss of power of the left arm and leg. On admission he was exceedingly ill, complained of great headache, and had partial paralysis of the left side, the arm being almost powerless, but the leg he could move a little. He soon after had three fits, in which he was convulsed all over, and screamed out. This he had done in previous attacks, and, it was said, acted like a madman, although in the slighter attacks he had retained his consciousness. In the intervals he complained of pain in the right side of the head and neck, and was so weak that he could not move his head from the pillow. He was almost totally paralysed on the left side; the

weakness increased since admission; sensation perfect; no paralysis of face; eyes unaffected, pupils natural; also great difficulty of swallowing, and mouth aphthous. His wife was sent for to sit up with him, as it appeared scarcely possible that he could survive long. As the patient had never been in a condition to give a good history of his case, his wife was questioned, and she said that he had had a fall two or three years before, also that he had long suffered from pains in the limbs, and that she had had several miscarriages and dead-born children. The patient was then again examined, and it was found that one clavicle was enlarged, as well as the os femoris on one side. All these circumstances suggested syphilis, and therefore the iodide of potassium, in ten-grain doses; was given. He began at once to improve in a most remarkable manner; only one or two more fits occurred; the paralysed limbs began to get stronger, and complete consciousness returned. His general condition also improved, and at the expiration of three weeks he was able to leave his bed and walk about. At the end of another week he had only a slight dragging of the foot, and he left the hospital convalescent, at the termination of not quite a month after the commencement of the medicine. The case afforded the most remarkable recovery I have ever witnessed from a disease of this severe character.

#### EYE, EAR, TEETH, ETC.

Various other affections, fully described by surgical writers, I need not dwell upon, such as *iritis*, although it would be interesting to ascertain the relation which the nodules of lymph on the iris hold to simple inflammatory exudation, and the resemblance to the syphilitic deposits in other parts of the body. Nor need I but allude to the affection of the cornea formerly styled strumous, and which Mr. Hutchinson has so well illustrated by cases in his lately published work under the appellation *syphilitic interstitial keratitis*. It is interesting, however, to remark, in reference to the statement made at the commencement of this paper, that it was merely the external parts of the body, and those which come immediately under the view of the surgeon, which were thought to be affected by syphilis, and thus that the iris was considered to be the only part of the eye affected by syphilis, whereas now we are informed that the cornea, conjunctiva, choroid, retina, and, in fact, all the structures of the organ, may be involved in a syphilitic inflammation.

I will only remark, as regards the *teeth*, that I consider Mr. Hutchinson has well made out his case respecting the alteration they undergo in syphilis, although the doctrine has not yet pervaded all branches of the profession. I have myself no doubt that the notched condition of the upper incisors is the

result of syphilis, and is due to an alteration in the form of the tooth when in the pulp, owing to the stomatitis which so often exists in the tainted child. I have seen this condition too often in association with a flattened nose (owing to an expansion of the nasal bones during an infantile periostitis), with corneitis, and other signs of syphilis, to doubt that it has been caused in the manner which the above-named surgeon maintains. (See Plate I.)

As regards the organ of *hearing*, this may be affected in syphilis, and principally in three different ways—from disease of the bone, from affection of the auditory nerve, or from contraction of the Eustachian tube in connection with ulceration of the pharynx.

The *skin* also has been a part so ably treated of by surgeons, that I need only say that in this organ, as in others, the same disposition to the formation of an albuminous product is seen. After the earlier exanthematous rashes, the disposition to the tuberculous form is well known, as well as the formation of condylomata. I might allude to a case published in a former number of this work, where keloid growths sprung up on the skin of a venereal patient, and thus showing the disposition to fibrous development.

The same disposition to the production of albuminous products in the skin has led some to think that there is a connection between syphilis and elephantiasis, especially in that form witnessed in Sweden.

The following case, in connection with a preparation in our museum, will show how the ear may become affected in syphilis.

Prep. 1592<sup>84</sup> shows the temporal bone in a state of caries, with some purulent matter between it and the dura mater.

John B—, æt. 37, under Dr. Back, in 1828. He had been a soldier, was of intemperate habits, had had syphilis, and taken large quantities of mercury. For some weeks he had suffered with pain and discharge from the left ear, and on admission he was found to have ulceration of the throat, with loss of the soft palate. Shortly before death there was a large discharge of matter from his ear. The post-mortem showed caries of the temporal bone, with inflammation of the lateral sinus and jugular vein, together with small abscesses in the lungs.

## TESTIS.

A deposit in this organ is very common, and often very characteristic. A section through it shows a number of nodules of a firm, yellow material, more or less circumscribed, but generally associated with some fibrous tissue pervading the gland-structure around, and causing its contraction. Thus, sometimes a general fibrous degeneration may be met with, and these nodules in the midst, so that little of the organ remains. If the deposit be in large masses and recent, the organ may be somewhat increased in size, but usually, when met with, it has undergone some contraction, and is smaller than natural. As in other organs the covering may be affected, so here the tunica vaginalis is often found adherent to the surface of the testis. (Plate II, fig. 4.)

I do not wish to connect the subject with any matter purely surgical, but I believe that the older surgeons did not regard an orchitis as one of the ordinary effects of syphilis, and those authorities whom I have personally questioned have not regarded it as one of the ordinary results. This would show that the deposition of albuminous matter and the fibroid changes have been slow and painless in their character, and thus been passed unobserved both by the patient and his medical attendant. This has been my own experience, and thus very often the state of the testes has been found accidentally after death in those who have never, during life, had any suspicion of disease of the organ, although this is by no means always the case.

During the last session of the Pathological Society, Dr. Ingram exhibited an enlarged testis, taken from a child the subject of hereditary syphilis.

CASE 1 (Testes, 2351<sup>67</sup>).—William C—, æt. 25, admitted into the syphilitic ward with an eruption and disease of the larynx; subsequently phthisis came on. After death a vomica was found in the upper part of the left lung, with some inflammatory deposit below it, and recent pneumonia at the base; other lung healthy. The epiglottis was quite gone; the glottis was thickened, and the neighbouring parts cicatrized; the disease, in fact, was cured. The liver was large and fatty. The testes were small, and occupied by streaks of fibrous tissue; in fact, they had almost completely undergone a fibroid degeneration.

CASE 2 (Testes, 2351<sup>68</sup>).—Thomas J—, æt. 34, a sailor, admitted into the hospital suffering from chronic dysentery and syphilitic rupia sores on the body. The



colon was extremely ulcerated, but particulars need not be here described. Liver contained an excess of fat. Both testes were very hard, the right was undergoing fibroid degeneration, the tissue being replaced by a tough fibre pervading it. The other contained isolated round masses of a yellow inorganizable deposit.

**CASE 3 (Prep. 2349<sup>45</sup>).—**A testis containing some hard yellow masses, which were styled scrofulous. They are unorganizable, inflammatory deposits, and probably syphilitic, as they correspond entirely with similar cases.

**John E—, æt. 27,** died of empyema of right side, together with chronic pneumonia of parts of the lung. There was also recent pericarditis. On the posterior border of the liver there was a cheesy mass, partly projecting and partly imbedded in the substance of the organ. Some of the neighbouring glands were also enlarged, and contained scrofulous (?) matter. The deposit in the liver is said to be of the same kind as that in the testes.

**CASE 4.—**This refers to Prep. 2351<sup>45</sup>, and a description of the case is found under Liver, No. 1, where the calvaria was much diseased. The testes were much wasted, very hard, and fibrous. The glandular structure had disappeared, and in them there were distinct nodules, exactly like those in the liver.

**CASE 5.—**This refers to Prep. 2351<sup>45</sup>, and description of the case will be found under Spleen, No. 1. Here the testes were very hard, and their structure almost completely destroyed by fibroid deposit in the form of nodules. One contained these isolated, the other in a mass filling the organ.

**CASE 6.—**This is described under Case 13, Liver, where the latter contained a deposit, and the testis one exactly like it.

In the following case I have no doubt that the deposit in the testes had a syphilitic origin, but the case is interesting also in reference to the remarks made under the heading Lung, where the connection between syphilis and scrofula is spoken of. It is held by some that the latter is nothing more than hereditary syphilis; but however questionable this may be, there can be no doubt that the effects on the system are often much alike. Thus, in the annexed case the laryngeal disease, disorganization of the lung, ulceration of intestine, and amorphous deposit in the testes, might be regarded as undoubtedly scrofulous, but we have seen how all these conditions are equally produced in constitutional syphilis. Those who would maintain a direct relation between the two diseases would have no difficulty in showing by such cases how a person broken down by the venereal disease would fall a victim to tubercle.

**CASE 7.—**William P—, æt. 42, had led a very dissipated life, and had had syphilis. For four years he had had chest symptoms, for a less period total loss of voice, and of late diarrhoea.

*Post-mortem examination.*—The larynx was much affected by old disease, the vocal cords being entirely destroyed, and its appearance presented rather the effects

of syphilis than tubercle. The lungs were adherent by very dense, tough fibrous tissue; the left was in that condition known as cirrhosis; that is, it was very dense throughout, the upper lobe especially being converted into a tough fibrous tissue, and little else was seen than the tubes passing through it. The other lung was similarly but less affected. The colon showed some isolated contracting ulcers, which were cicatrizing. The left testis contained a large mass of inflammatory deposit.

*Connection between scrofula and syphilis.*—In the above case the point of interest refers to this question; and as it is one which is raised every day, I cannot do better than quote two cases which have lately been under my care, in order to show that we should not be too ready to style every case of cachexia scrofulous, and that we should be awake to the existence, of hereditary syphilis, even in the adult. In the following case the disease had always been regarded as scrofulous, but no good arguments could be used against the suggestion of syphilis. A very similar case of a young man, with enlargement of the bones, waxy viscera, and a characteristic flattening of the nose, was lately under my care, but the report of the case is, unfortunately, mislaid. His had always been regarded as a case of scrofula. In the second case, next given, it will be seen that the lad was more benefited by mercury than by any other remedy, a fact which must be used as an argument in favour of the syphilitic nature of his disease.

CASE 1.—Frederick P—, æt. 20, admitted October 31st, and died December 26th, 1860. The lad had been under my notice for several years; he was very diminutive, and had not yet arrived at puberty. His tibiae were bent forwards, and somewhat enlarged. The soft palate was quite destroyed, leaving a large, ragged ulcer; there was a hole in the roof of the mouth, whence some bone had been removed. The nose was also flattened. It was a question whether this lad was suffering from strumous disease or hereditary syphilis. On his last visit, as an out-patient, his legs were oedematous; he was then taken in, and the urine was found to be albuminous. The liver and spleen were felt to be enlarged. He died at last of acute peritonitis. It was thought, from his general cachexia, that the organic disease of the viscera was of the lardaceous kind.

*Post-mortem examination.*—Body wretchedly cachectic looking, and appearing like that of a child. There was acute peritonitis, and, besides this, adhesions in several parts, especially in the upper part of the abdomen, the liver being closely adherent to the diaphragm above, as was also the spleen. The liver was very large, and lardaceous throughout. Spleen much enlarged, and lardaceous. Kidney lardaceous.

CASE 2.—Edward B—, æt. 19, admitted under Dr. Wilks into Stephen Ward, on

January 19th, 1859, for an ulcerated throat. He stated that he lived at Dartford, and had been ailing for two months, but his throat had been bad for only six months. His general appearance resembled rather that of a boy of twelve, owing to his extremely short stature and attenuated frame; his long eyelashes, husky cough, and wasted limbs, suggested phthisis in almost its last stage. On examination, however, his lungs were found healthy, as were all other parts of the body, excepting the throat, in which a large ulcer existed. The soft palate was quite destroyed, together with the tonsils, and the ulceration extended to the pharynx, and in front along the roof of the mouth towards the teeth. The surface was covered with a dirty green secretion, and the edges were of a dull-pink colour. The teeth were small, yellow, and notched. The surface of the ulcer bled on the slightest touch, and the whole of it presented a most unhealthy aspect, so as to suggest, indeed, to some who saw it, a cancerous nature. The boy appeared quite innocent of any syphilis of his own acquiring. His scrofulous and wasted appearance suggested bark and chlorate of potash, with wine. He continued this until February 8th, when, being no better, some quinine and cod-liver oil were ordered. Under this his health somewhat improved, but the throat made little, if any, progress.

On March 1st, after a conversation with Mr. Hutchinson on the probable syphilitic nature of the case, the patient was ordered to rub in mercurial ointment night and morning, and take three grains of iodide of potassium three times a day. From this time he began to improve, and in the course of ten days the sore was granulating, the edges were contracting, and the whole surface was rapidly healing. He soon after went out cured, as to the throat.

*Ultior effects of syphilis.*—In the cases just alluded to I believe the ulterior effects of syphilis are seen in the production of the lardaceous or waxy organs. This form of disease may come on while the more immediate effects of syphilis on the system are still seen, and thus the fibroid deposits and lardaceous changes may be associated as before shown. It is not necessary, however, that any of these peculiar depositions take place in the internal organs, and therefore the patient may pass through the syphilitic stage, and finally fall into that cachectic state when the ulterior change comes on. In the cases last mentioned the absence of fibroid deposit did not disprove syphilis, and therefore I give the following as a very common case in illustration.

Ann O—, æt. 47, for syphilitic necrosis of the bones of the head and face, and general cachexia. She had suffered from the effects of syphilis and mercury for twenty years. Before her death the ankles and face became œdematous, and the patient sank into a quiet state of stupor, denoting an impaired action of the kidney. The body was wasted, the nose- and palate-bones were quite destroyed, nodes on tibiae, and scars existed on the extremities. Brain healthy. Heart and lungs healthy. Liver—surface nodulated and uneven from old capsulitis; the interior showed considerable lardaceous and fatty degeneration, and also a considerable increase of dense fibrous tissue, as in early cirrhosis. Spleen was considerably ad-

vanced in the lardaceous change, more than half its substance being occupied by the adventitious material. Kidneys mottled and fatty; they also contained some lardaceous material.

#### PLACENTA.

With regard to the subject of syphilitic diseases of the placenta, I have no observations of my own to offer, and should have been silent on this matter had not a predecessor at Guy's Hospital made some remarks on this subject several years ago, and long before the modern views respecting the constitutional effects of syphilis had been propagated. Mr. Wilkinson King has left behind him notes of several cases of abortion where he supposed a syphilitic disease of the placenta was the cause. In reading these cases it is impossible to declare whether or not his inference was correct, for there is no means of ascertaining from his description why he regarded one form of disease as simply a deposit of fibrin from the blood, another as lymph resulting from inflammation, a third as scrofulous, and a fourth as syphilitic. Certain it is, however, that cases are given where a history of syphilis was well marked, in which abortion took place, and a deposit of adventitious material was found in the placenta, and where also, under a course of medicine, the mothers subsequently bore living children.

It is a fact, of course, in every one's knowledge, that syphilitic parents constantly abort; but the reason is not always apparent, or this subject would not now be brought under notice. Where the foetus itself is much diseased the reason is evident, but where the child is apparently healthy some of the most celebrated accoucheurs have had recourse to an explanation referable to an irritability in the uterus of the mother, as a cause of its throwing off its contents prematurely. The subject, therefore, of disease of the placenta itself as a cause of abortion, is one well worthy the consideration of obstetric physicians.

The following cases are from Mr. King's notes, and on which I shall make no comment, merely offering them as highly suggestive to others; but in the last case given, No. 9, a question may arise whether syphilis contracted at the fifth month could contaminate the child. Upon this point—the in-

fection of the child after a certain period of its development—authorities differ in opinion, but several cases have been reported of a like nature to the present, which would seem to corroborate the facts there given. Ricord thinks that if infection of the mother takes place during the last three months, transmission is very doubtful, if possible, but before this it can occur.

CASE 1.—A woman, who had never been well since her husband gave her syphilis, had had five successive miscarriages, and now again aborted at the third month. The chorion was thickened, and surrounded by a false membrane. She had Plummer's pill administered with sarsaparilla, and since had a living child.

CASE 2.—A woman, who is covered with a leprous eruption of a secondary character, had already had one abortion, and now miscarried again at the third month. The chorion was coriaceous, and surrounded by a false membrane. The amnion lined by a false membrane.

CASE 3.—A woman, who was formerly a nymph of the *pavé*, had never gone her time, but aborted six times, and once of twins. She now again miscarried at the fourth month. The chorion was thickened and coriaceous, with adventitious membrane. Funis distended. She was treated with blue pill and sarsaparilla. The patient has since been delivered of a living female child, and is again pregnant.

CASE 4.—A woman, whose husband is very gay, and she herself formerly on the town. Had already had eight abortions, and now again miscarried at the fourth month. The chorion coriaceous. Amnion thickened, and lined by a false, shaggy membrane. Alterative medicines were given for some months, and she has since given birth to a living and apparently healthy child. She was again pregnant when I last saw her.

CASE 5.—A woman had had three living children, and afterwards had sores on the genitals, and since miscarried five times. Again miscarried at fourteen weeks. Chorion thickened, and lined by a villous membrane, easily separated.

CASE 6.—A woman, who has a very loose husband, and she herself covered with syphilitic lepra. She had had one miscarriage, and now again aborted at the twelfth week. She was ordered mercurial and alterative medicines, and since had a living child.

CASE 7.—A woman who had had syphilis aborted at her first pregnancy, at about three months. The chorion thickened; amnion dark, and lined by a villous membrane.

CASE 8.—A woman with syphilitic lepra had already had one miscarriage, and now again aborted. The chorion coriaceous; amnion lined by a false membrane.

CASE 9.—A woman, æt. 18, was pregnant five months with her second child, when she contracted syphilis. She was put under treatment, and confined to her bed for some time. She was delivered of a seven months' child in a dreadful state of putrefaction, and the liquor amnii was horribly offensive. After delivery there was considerable hæmorrhage, and on examination there was found a pretty firm adhesion. This was separated with difficulty. The placenta, on its uterine aspect, presented a spot of gray colour, due to a deposit of one eighth of an inch thick.

Throughout the structure of the placenta there were patches of consolidation. The chorion was thickened and rough.

## BONE.

It has been hitherto generally assumed that the caries and necrosis of bone occurring in syphilis are of the ordinary kind, such as arise from the inflammation set up by injury; but recent investigations would tend to show that these processes in syphilis are peculiar. If this be true, it would explain much of the contradictory opinions which are held respecting the proportionate effects of syphilis and mercury on the osseous system. If, as was said at the commencement of this paper, it be considered by some that caries of the bones in syphilitic patients is always the result of an undue administration of mercury, it would be important to show that this is not so, but that the caries is of a peculiar kind, and one of the results of syphilis, occurring without the interposition of remedies. Of this I have no doubt, although, if the destruction of bone extend to a great degree, this may be due to an excess or abuse of mercury. It is to Virchow especially that we are indebted for investigations in this subject, and the result he arrives at so accords with the well-known appearance, that there is little doubt that his observations are correct. He maintains that in the cranium, for example, a similar process takes place as in other parts—a deposition of albuminous material occurring in connection with the periosteum without, or the dura mater within, and that the medullary or vascular canals are filled with the same kind of gummy substance as in other parts, when a node is produced; also that this may ossify, producing new bone, or that a caries may result. On the cranium the latter is seen forming a depressed centre, with a deposition of new bone around in a dentated form, giving it a cicatiform appearance, just as is witnessed in the pharynx or other part.

An examination of the skulls in our museum will afford sufficient illustration of this fact; several will be seen showing the cicatiform or puckered appearance on their surface, the peculiarity being the destruction of the bone at the centre and the increase at the circumference, the caries having also a peculiar worm-eaten character. In ordinary caries from injury

a destruction may be seen going on, and a development of new bone around, with smooth edges, and having the other ordinary features, without possessing the above-named peculiarities; also, in skulls which exhibit a destruction of tissue by cancer or lupus, the bone is simply eaten away, without any disposition to the formation of new osseous material. It will be observed that the deposition of the yellow albuminous material between the skull and dura mater in many of our specimens (which we need not particularise, but refer the reader to our shelves) is peculiar, whereas in ordinary cases of disease from injury a suppuration is more likely to occur.

In simple syphilitic caries there is no suppuration, and in this lies its peculiarity and an evidence of its origin. If, after a blow on the head, even if the scalp be not cut, if the bone becomes carious in consequence, some purulent matter is generally found on the surface, or in the *dipl e*; but in syphilis the scalp may be quite sound, and yet, when removed and the periosteum torn off, a caries may be discovered which was quite unanticipated, and presenting the peculiarities above spoken of. It is for this reason that Virchow has styled it *dry caries*. The same peculiarity occurs with regard to a node on the tibia, which only suppurates under peculiar circumstances, and therefore requires us carefully to distinguish a true syphilitic affection of the bone from one which is merely secondary to an ulceration of the surrounding soft parts. The former is that of which I am now treating, and takes place quite independently of any affection of the adjacent soft structures. Our preparations will show that sometimes, instead of a caries taking place, the exudation ossifies, and thus the bone becomes much enlarged or hypertrophied; and herein lies another argument against the affections of the osseous system being due to mercury, since the property of the latter drug is to destroy or disintegrate. No one, as far as I know, has yet considered enlargements of the bone to be due to mercury, at the same time that he has held the doctrine of the destruction of bone to be attributable to this drug. In a word, there is a disposition in syphilis to the production of an albuminous product beneath the periosteum and in the vascular canals of the bone. This may ossify, producing enlargement or hypertrophy of the part, or if ulceration takes place a caries results; but here, as in the soft parts, a distin-

guishing feature is in the presence of a new material around it. As also in the former case the ulceration is likely to increase from any cause tending to a disintegration of the tissues, so the caries of the bone may extend to a great degree under like circumstances, and especially under the influence of mercury. Thus are the two opinions reconciled—that all great devastation of the osseous system is met with only in those who have taken much mercury, and yet that mercury itself does not originate disease of the bone.

It will be seen that I place together caries and necrosis as processes which cannot be separated, except in reference to the degree of destruction of the tissue, and so also with regard to periostitis and osteitis. Since the periosteum pervades the substance of the bone through the medullary canals, the albuminous matter which is exuded from this membrane may equally occur on the surface of the bone or in its intimate tissue, and therefore, also, new bone may arise in the substance or on the exterior; the one may predominate more than the other, but in many of these syphilitic cases the two processes occur together, and thus the terms osteitis and periostitis have often more an artificial than a real significance.

Reference has been made to the opinion of constitutional syphilis being the same as scrofula, and thus, in the cases given in illustration, the enlargement of the bones, which I believed to be due to syphilis, was considered by others as scrofulous. Those who maintain that the destruction of the bone witnessed in syphilitic cases is due to mercury, could scarcely admit that hypertrophy was due to the same agent, and therefore, in denying that syphilis could be a cause, they have referred it to scrofula. According to the remark just made, I believe syphilis to be the most efficient cause.

Disease of the bone is not commonly met with in hereditary syphilis, but in our museum is the skeleton of a child, three years of age, in which the lower end of the os humeri is much enlarged. There is no history, and therefore the specimen might suggest to different observers either syphilis or scrofula.

The drawing (Plate II, fig. 1) shows an example of syphilitic caries of the cranium, and of which numerous examples may be seen in any museum.



*Four Plates, representing the Effects of Syphilis on the Organs  
of the Human Body.*

PLATE I

Represents the face of a young woman who had suffered from the effects of hereditary syphilis. It shows opacity of the cornea, flattening of the nose, and a notching of the upper incisor teeth. The latter are drawn below on a larger scale.

PLATE II.

- Fig. 1.* Portion of cranium, showing syphilitic caries of the os frontis. The indentated circumference is seen in the larger spot, and the cicatriform character in the smaller.
- „ 2. Portion of brain, with the dura mater, showing the arachnoid surfaces adherent by a firm, adventitious deposit, which also involves the brain-substance.
- „ 3. Portion of spleen, showing a syphilitic deposit.
- „ 4. Testis, showing several syphilitic deposits.

PLATE III.

- Fig. 1.* Section of liver, showing a large deposit, with a cicatriform appearance of the surface, and with several other smaller nodules around it.
- „ 2. Portion of lung, showing two deposits, one softening.
- „ 3. Contraction of bronchial tube from syphilitic ulcer.
- „ 4. A syphilitic nodule, situated in the glottis.

PLATE IV.

- Fig. 1.* Contraction of the upper part of the œsophagus, in consequence of ulceration.
- „ 2. Contraction of the trachea, from syphilitic disease.
- „ 3. Heart, with deposit in septum, probably syphilitic.





Fig 1

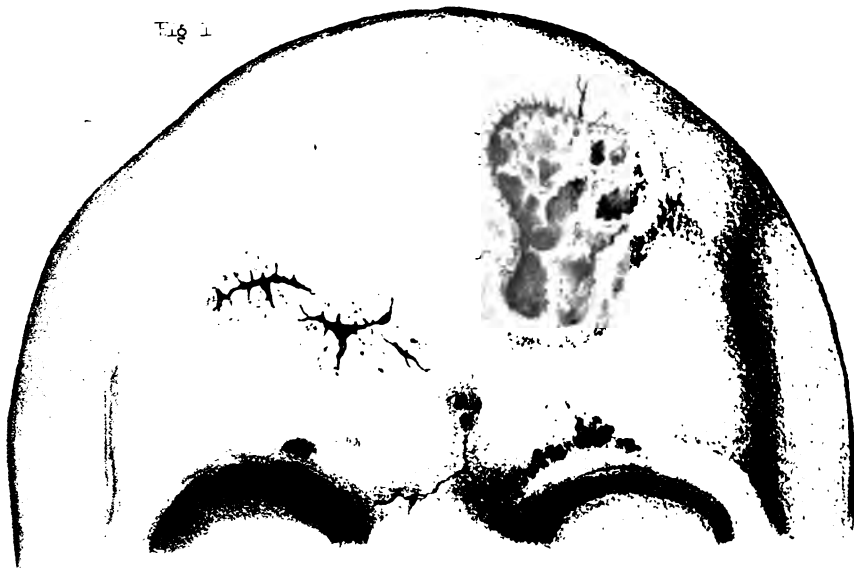


Fig 2

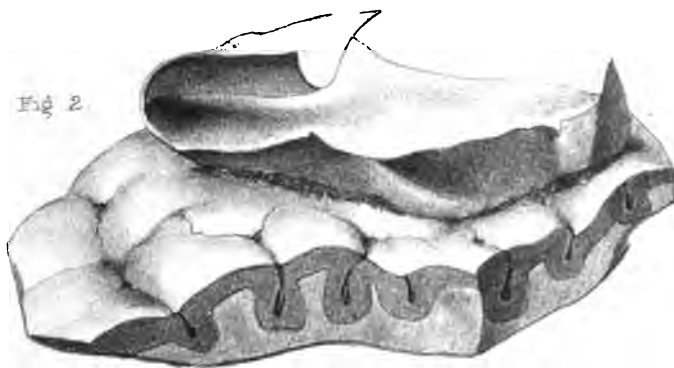


Fig 3



Fig 4

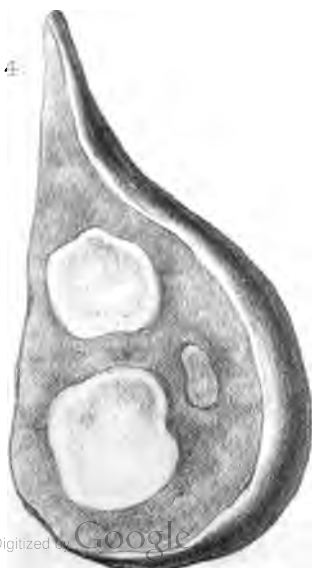




Fig 1

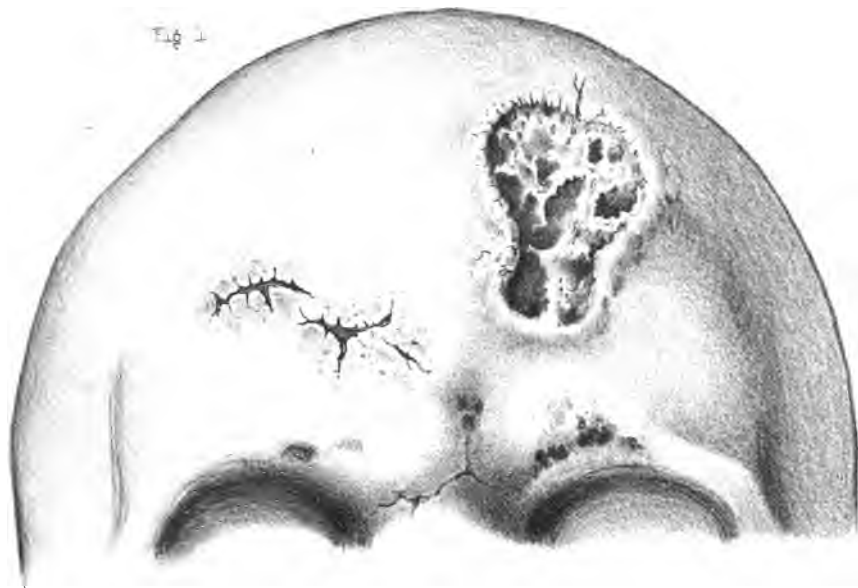


Fig 2

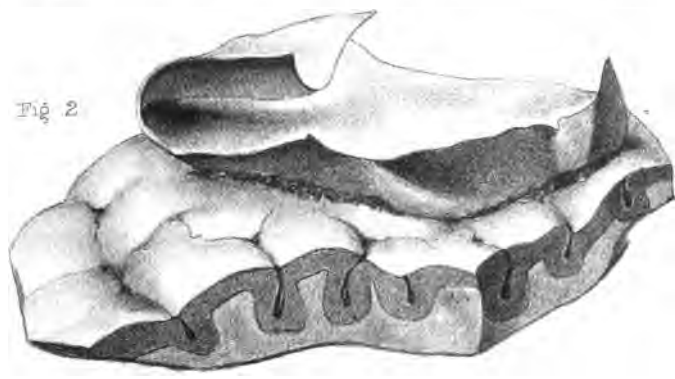


Fig 3

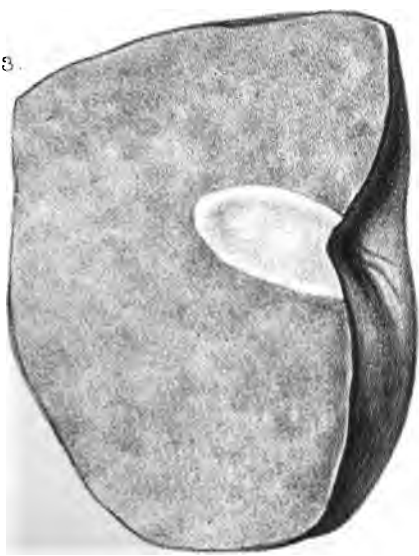


Fig 4



Digitized by Google



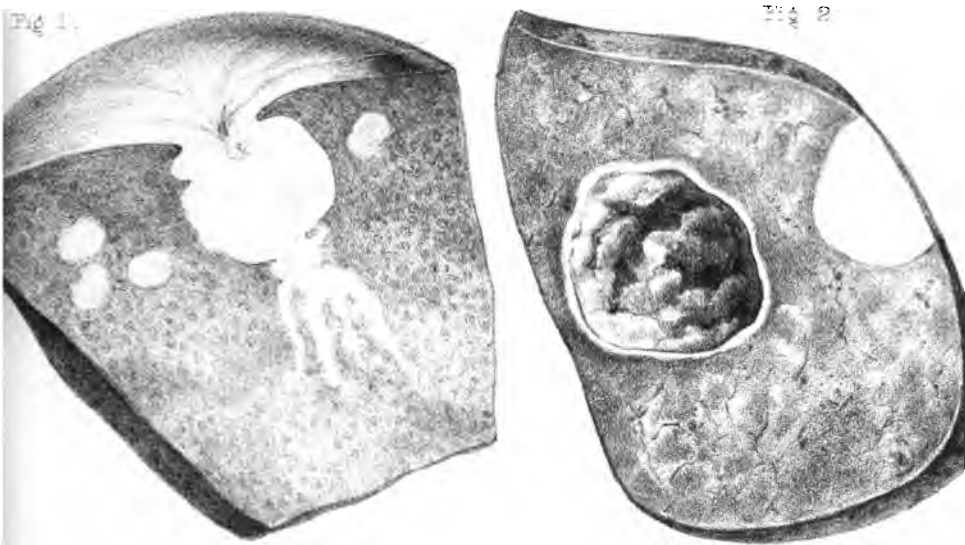


Fig 3.



Fig 4.







ON  
PULSATING AND ANEURISMAL TUMOURS  
OF THE  
ABDOMEN.

---

By S. O. HABERSHON, M.D.

---

PULSATION serves as a distinguishing mark by which we may classify tumours in the abdomen ; yet this sign may be communicated to a growth by contact with a large artery, so that tumours may be pulsatile, but not aneurismal.

Aneurism of the large abdominal vessels occurs in comparatively early life, but advanced life is not altogether exempt. Of thirteen cases before us, the average age is 40 ; if a larger number of instances be taken, the average is nearly the same, 40 or 41. Dr. Crisp states that of fifty-nine cases of aneurism of the abdominal aorta, eleven were between 20 and 30, twenty-two between 30 and 40, fourteen between 40 and 50, three between 50 and 60, and the ages of nine were not given. The earliest age of abdominal aneurism that I have seen recorded is an instance mentioned by Dr. Gairdner in his 'Clinical Medicine,' of a young woman only 16 years of age, in whom the superior mesenteric artery was diseased. It is very uncommon also to observe this disease in women ; of the instances before us, eleven were men, and two were women ; of the latter, one was a remarkable case of dissecting aneurism at 75 years of age. Of Dr. Crisp's tabulated cases, fifty-one were males and eight were females ; and in several recorded cases of women affected with aneurism it has occurred in early life, and in persons of irregular habits.

The *symptoms* of aneurismal disease in the abdomen may be

VOL. IX.

regarded in three aspects :—1st, the *negative signs* ; 2nd, the *character of the pain* ; and, 3rdly, the *character of the pulsating tumour*. As to the *negative signs*, the *absence of constitutional disturbance* is remarkable ; the patients are often well developed, well nourished, and they might be regarded as in robust health. At the later stages of the disease, when the sufferer is becoming exhausted from the intensity of the pain, and from its long continuance, the countenance assumes a haggard and distressed appearance, and the frame wastes. There is generally the *absence of the symptoms of organic gastric disease*. In aneurism, pain in the back and hypochondrium is experienced, but we do not find that it is modified by food, except in some special instances, where there has been pressure on the duodenum, or on the œsophagus at its gastric termination ; the appetite may be good, and digestion easily completed ; the tongue is clean ; the complexion is generally clear ; the bowels are easily acted on, although often constipated ; vomiting may be present, but it occurs irregularly, and still more rare is the rejection of blood ; the rupture of an aneurism into the œsophagus or duodenum has sometimes simulated bleeding from the stomach ; and pressure on the bile-ducts has produced jaundice. There is also the *absence of effusions into the peritoneal cavity*. Dr. Stokes has drawn attention to these facts, that in aneurism there is no evidence of effused lymph, and that no friction sound is produced ; that in uncomplicated cases we do not find serous effusions into the peritoneum, nor have we generally enlarged superficial veins, as in tumours obstructing the return of blood. In one of the cases we have recorded the superficial abdominal veins were enlarged, for the sac was on the right side of the aorta, extending below the kidney to the psoas muscle and to the diaphragm, so that the vena cava was slightly pressed upon. Dr. Gairdner mentions a similar symptom in a case given in the 'Edinburgh Medical and Surgical Journal' for 1855. The occurrence of valvular disease of the heart, and of organic disease of the kidney, or the rupture of the aneurism itself into the cava, produces other and characteristic symptoms. In aneurism of the abdomen *the urine is generally normal* in its reactions. It is very important carefully to examine the urine, not only for albumen, but for minute traces of blood ; renal calculi have been suspected in these instances ; but the

repeated examination of the urine displays the true character of the disease; the urine should be allowed to stand, and the lower stratum examined with the microscope. Still, organic disease of the kidney may be a coincident circumstance, as in Cases 9 and 10; and Dr. Ogle, in a case in which the urine was of low specific gravity and albuminous, without disease of the kidney being recognised after death, referred the abnormal secretion to sympathetic irritation of the gland. If the symptoms occur in women, it would be equally important to notice the state of the uterus and ovaries. Dr. Sibson states that, among the general symptoms of abdominal aneurism, dyspnœa has been observed in 8 per cent., cough in 2·5, dysphagia in 6·5, sickness in 8, dyspnœa in 15, and constipation in 19 per cent.; these facts, however, are not opposed to the statement that in aneurism of the abdominal aorta the constitutional symptoms are slight. Hodgson writes that aneurism of the abdominal aorta is "attended with frequent sickness, more especially after food is taken into the stomach, and by its pressure produces symptoms like those of stricture of the pylorus." In the instances which have come under my own notice, vomiting has been less constant than this remark would imply. Again, Dr. Copland regards constipation as being *always* present in abdominal aneurism.

The *second sign* to be especially noticed is the character of the pain. Pain is a very constant indication of aneurism, and it has been described correctly as of a double character, one constant and uniform, the other more intense and paroxysmal; the former is wearisome and distressing by its duration, the latter agonising in its severity. The first kind of pain has been attributed to erosion of the vertebræ; but Dr. Stokes has truly remarked, that erosion of the vertebræ may exist without pain, and pain may also exist without erosion. The intense paroxysmal pain is apparently due to the distension of nerve-filaments upon the aneurismal sac; in an instance under my own observation a small aneurismal sac, without erosion of the vertebræ, led to intense pain; and after death I found the branches of the sympathetic nerve largely spread over the sac. The pain is without febrile excitement, and with rare exceptions there is neither rigor nor perspirations, as in hectic fever. The pain is found to be in the course of the spinal nerves in

the loins, or it extends to the anterior walls of the abdomen ; sometimes it is in the course of the last dorsal nerve over the crest of the ilium, or in the course of the genito-crural nerve to the testes, or in the direction of the sciatic nerves to the lower limbs, or in that of the anterior crural to the front of the thigh. There are sometimes cramps in the legs, numbness of the feet, and in rare cases paraplegic symptoms ; or the pain has been located in the joints, and the disease has simulated rheumatism. These modifications of suffering are produced by pressure upon or by the stretching of nerve-filaments, and in rare cases the disease has extended through into the spinal canal, and it has affected the cord itself. Still, although pain is generally one of the most prominent symptoms, instances do occur in which there is no mention of it ; and the disease may manifest no symptom till suddenly fatal rupture has taken place, or the disease may be first shown upon the post-mortem table, death having taken place from some other cause. Morgagni gives an instance of abdominal aneurism in an old man, from which there was no pain, no sense of weight, and no dyspnœa ; the disease was not diagnosed, but after death rupture was found to have taken place into the left thorax ; several cases are now recorded in which the disease was not recognised during life.

The pain of aneurism, however, undergoes variation ; a constipated condition of the bowels may greatly increase it, so also flatulent distension ; and in the remarkable case of Dr. Beatty the pain disappeared under powerful mental emotion.

The *third characteristic sign* of abdominal aneurism is the *presence of a pulsating tumour*. Aneurism generally occurs near the commencement of the abdominal aorta, in the neighbourhood of the cœliac axis, and the growth extends from this part ; if the tumour enlarges upwards from the pelvis, it is more likely to be ovarian or glandular. As the tumour passes downwards, it is more frequently found on the left than on the right side ; but if the cœliac axis or the mesenteric artery be affected, the sac may be found to increase directly forwards. The pulsation is generally uniform, and is not removed by withdrawing the pressure from the abdominal aorta. The uniformity of the pulsation is modified if the sac be situated

behind the strong lumbar fascia, or if it contain much fibrinous deposit. The pulsation has also been shown by Dr. Lees to be diastolic in character, but it is sometimes very difficult to find an interval between the systole of the heart and the aneurismal impulse. A bruit may often be heard at the site of the tumour, but this symptom is not unfrequently absent; and the bruit, if present, may be systolic or double; generally, however, it is systolic. Dr. Corrigan has noticed that the murmur is at an early stage more distinct when the patient is in a recumbent than when in an erect posture, because there is less tension in the sac; but a tumour pressing upon the aorta often communicates a systolic bruit, and one which is more distinct in a recumbent position, on account of greater pressure being then exerted upon the vessel. When regurgitation through the aortic valves also exists, we might easily be misled by the presence of an abdominal bruit, for in such cases there is much arterial throbbing, and the lining membrane of the arteries is often diseased. It is remarkable, however, that aneurism of the abdominal aorta is much less frequently associated with disease of the heart than is aneurism of the thoracic aorta; the heart is in the former generally healthy, although we give several instances in which the reverse was the case (Nos. 8 and 9).

Pulsation is not always equally distinct in abdominal tumours, for when occurring at the posterior part of the aorta, close to the diaphragm, and when the sac passes *beneath the strong lumbar fascia*, pulsation is very indistinct at the earlier stages, as in No. 1. When the tumour extends forwards impulse is more easily perceived, and it is generally felt in the left hypochondrium, or at the scrobiculus cordis. Occasionally it is first perceived in the loin, between the last rib and the crest of the ilium. As the sac enlarges, there may be visceral displacement, the liver may be pushed forward, so also the kidney, spleen, or pancreas. The thoracic viscera are also encroached upon, and dyspnœa and palpitation of the heart are induced.

Abdominal aneurism *terminates* in three ways — either from gradually increasing exhaustion, or from rupture, or, thirdly, its further increase is prevented by layers of fibrin, and it may be said to be cured. In the first case, the patient

sinks from the severity of the pain, for the intense and almost constant suffering is greater than the system can sustain ; in an instance of this kind, under my own observation, the aneurism was small, but the large branches of the semilunar ganglion were spread out upon it ; the pain was of an agonising character, and unrelieved by anodyne medicines, and the patient sank without any rupture of the sac taking place. Rupture of the sac is the more frequent cause of death ; but the symptoms consequent on the extravasation of blood are very different, according to its rapidity and its interference with other vital function. If the blood be slowly effused behind the peritoneum, the patient at first may experience *relief* to the severity of the pain ; he becomes more pallid, or a state closely approaching syncope is produced ; if the tumour reach to the cellular tissue of the iliac fossa, it becomes more prominent, and pulsation is also very distinct. In this way the extravasation may even extend to the thigh, and simulate psoas abscess. If, however, the aneurismal tumour have projected anteriorly, as when the coeliac axis or mesenteric artery are involved, and rupture take place behind the peritoneum into the cellular tissue of the posterior or anterior walls, or into the mesentery, the tumour is found to have subsided, the murmur is changed in character, and a state of syncope, of greater or less duration, precedes death. If the rupture take place into the peritoneum, the subsidence of the tumour is still more sudden, and syncope is at once fatal.

The *position* of abdominal aneurism is frequently close to the diaphragm, the crura are often spread out upon the sac, and the tumour encroaches partly into the thorax ; the rupture, therefore, often takes place into the pleura, and more frequently on the left than on the right side. There may be indication of this rupture in sudden and severe pain in the side, with urgent dyspnœa, preceding the syncope ; but death often takes place almost instantaneously, for not only is there extravasation of blood, but the lung is compressed, and the action of the heart impeded.

Dr. Sibson, in his 'Medical Anatomy,' gives the following table in reference to abdominal aneurism, that rupture took place :

"In 77 per cent. ; and that in 28.5 it was into the peritoneum.		
"	"	in 8.0 into the mesentery.
"	"	in 9.0 into the left pleura.
"	"	in 6.5 into the right pleura.
"	"	in 22.0 into left hypochondrium, behind the peritoneum.
"	"	in 4.0 into the right hypochondrium.
"	"	in 7.5 into the duodenum.

And "that of the twenty-one cases that ruptured behind the peritoneum into the left hypochondrium, or presented diffused false aneurism in that region, the sac communicated with the aorta posteriorly in seventeen, anteriorly in only three cases."

Perforation into the alimentary tract is rare. Dr. Thomas H. Babington, in the 'Dublin Medical Journal' of 1856, records an instance of death from hæmorrhage, consequent on the bursting of an aneurism of the pancreatic artery into the duodenum. The patient was a prostitute, æt. 25, who was suddenly seized with extreme exhaustion ; there was vomiting and purging of blood ; fatal syncope took place in twelve to fifteen hours ; for several months she had experienced a dull, heavy pain in the epigastric region, which had increased in severity. The duodenum was found to be full of blood ; and in an interesting case of aneurism of the superior mesenteric artery, recorded, by Dr. W. T. Gairdner in his 'Clinical Medicine,' it is probable that bleeding first took place into the duodenum twenty-two months before the fatal rupture into the peritoneum.

*Diagnosis.*—The diagnosis of abdominal aneurism is at an early stage often obscure. First, as to *pain*—that in the loins has been mistaken for *rheumatism* and *disease of the spine* ; the pain in the abdomen has simulated disease of the kidneys, *renal calculus*, and *simple colic* ; and sometimes so slight have been the general symptoms, that the patient has been regarded, as if his complaints were imaginative rather than real. As regards pain simulating that of aneurism, cases of great difficulty occasionally occur ; several years ago a man, about fifty years of age, applied as an out-patient at Guy's, suffering from fixed pain on the level of the tenth rib, about midway between the spine and the scrobiculus cordis. On very careful examination, no cause for this constant suffering could be detected ; no evidence of pleuritic disease nor of disease of the spine



existed; the abdominal viscera appeared to be healthy, for no disease of the kidney, stomach, spleen, or pancreas, could be found. He was admitted several times into the hospital, and was as often partially relieved by counter-irritation. After two or three years he died from another cause, and it was found that a small patch of dense fibrous tissue, near to the spleen and upon the rib, had involved the branch of the dorsal nerve and produced the pain. Although the pain in aneurism sometimes subsides, still it is not benefited by counter-irritation. Careful examination will enable us to distinguish from any disease of the spine in most cases, and the same may be said of renal affections.

The presence of *abnormal pulsation* is another of the signs of aneurism which requires attention. This may occur without tumour.

1. In hysteria, abdominal pulsation is sometimes extreme, but the symptoms are variable, the throbbing is more diffused, nervous excitement is evident, and there are the sudden changes of hysterical disease. In this state of the nervous system portions of the abdominal muscles are often thrown into spasmodic contraction from trifling causes, and then a rounded, defined swelling, a phantom tumour, is felt under the hand.

2. In dyspepsia abnormal pulsation is often perceived, and it is especially marked when there is flatulent distension of the stomach and intestine. There may be associated with this state the pain of colic, tending still more to obscure the diagnosis. The evident symptoms of disordered digestion, and the amenability to treatment, indicate the character of the disease; the pulsation may be traced in the course of the aorta, and is diminished by action from the bowels and by eructation. A case of this kind was lately sent to me as one of aneurism, and the pulsation and distress were entirely relieved by a combination of decoction of aloes, and of the compound gentian mixture.

3. In functional disease of the ovaries, and in pregnancy, abnormal pulsation is of common occurrence. The age and sex of the patient, the state of the catamenial function, the state of the uterus, beside the constitutional symptoms, lead to correct diagnosis, and in women aneurism is comparatively rare.

4. Local disease in the parietes leading to suppuration is marked, not only by local pain, but by much throbbing. The pulsation is felt to be superficial, and the local disease very soon manifests its true character.

5. Excessive pulsation in the abdomen is felt in dilatation of the heart, in states of anæmia, but most of all in regurgitant state of the aortic valves, and especially when there is general disease of the inner coat of the arteries; with the state of aortic regurgitant a double bruit may be heard at the *scrobiculus cordis*; and if any hepatic enlargement or retained fecal concretion lead to pressure upon the aorta, it is easy to suppose that aneurism exists with the aortic disease.

6. Pulsation at the *scrobiculus cordis* may also be produced by the heart being pushed downwards by thoracic effusions.

In an instance lately under the care of one of my colleagues, in which aortic regurgitation was present, and a large thoracic aneurism occupied the whole of the left side of the chest, the pulsation was so great in the left hypochondrium, and at the *scrobiculus cordis*, that it was sometimes doubted, whether aneurism did not exist in connection with the abdominal, as well as with the thoracic aorta.

7. In the event of a tumour or enlarged gland pressing upon the aorta, pulsation is communicated, and the diagnosis is often difficult. The most frequent growths of this kind are enlargement of the left lobe of the liver; cancerous infiltration into the pancreatic glands, as No. 14; enlargement of the pancreas; cancerous disease of the stomach, as No. 15; circumscribed effusion or abscess at the lesser omentum, as No. 16. The pulsation in these cases may be as great as in aneurism, but Dr. Stokes states that, with the exception of fluid cysts, the pulsation is never diastolic, as has been observed in aneurism. The pulsation is generally lessened by placing the patient on his hands and knees, so as to remove the pressure from the artery. The pain is not of the severity observed in aneurism; and in the cases of hepatic and gastric disease, characteristic symptoms of affections of those parts are present, in the one sallowness or jaundice or disordered condition of the urine, in the latter more persistent vomiting and cachexia. Still, jaundice has been observed as a symptom of aneurism of the superior mesenteric, as in the instance recorded by Dr. Wilson

in the 'Tr. of the Royal Med. and Chir. Soc.' In disease affecting the pancreas, or situated at its site, the constitutional symptoms may be at first very slight, but a change in position produces a greater modification of pulsation than we find in true aneurism. Dr. Stokes quotes a very interesting case in which hepatic abscess simulated aneurismal disease, in which there were hectic symptoms; a pulsating tumour with diastolic pulsation was followed by effusion of pus by stool and by vomiting, and recovery took place. In reference to the diagnosis of abdominal aneurism, Mr. Hodgson writes—"Various diseases are attended with a pulsation in the epigastrium, which renders them liable to be mistaken for aneurism of the aorta or celiac axis." "Tumours growing from the diaphragm, pancreas, pylorus, and mesentery, and attached to the aorta and great blood-vessels, sometimes produce a pulsation in the epigastrium. The symptoms peculiar to such diseases are in most instances sufficiently marked to enable us to discriminate them from aneurisms, and the pulsation is more general and diffused than in the latter disease. The inferior cava is sometimes preternaturally dilated; in such cases an undulatory pulsation has been observed in the epigastrium (Burns). The heart is sometimes thrust downwards by collections of fluid, or by tumours in the chest, and its pulsation is distinguishable in the epigastrium." "The absence of the pulsation of the heart in its natural situation, and the impediments to respiration, will point out the cause of this symptom. In external adhesion of the pericardium, when the heart contracts, it pulls up the diaphragm, and the liver is thrown against the abdominal muscles, so as to produce a pulsation in the epigastrium." Several years ago, in Guy's, an aneurism of the external iliac exerted pressure in the pelvis, so as very closely to simulate ovarian disease; there was retention of urine, and some difficulty in drawing off the urine, although the patient was a female (No. 12).

The most frequent *cause* of aneurism of the abdominal aorta is excessive muscular exertion; sometimes the employment is of a laborious kind; at other times the disease is directly referred to a sudden strain of the abdominal muscles, or to a blow. In 1858 a man was brought to Guy's Hospital who had crushed his finger by machinery, and after the finger had been dressed he returned home; but on the following day

he appeared so ill as to require admission ; he rallied for several days, but then complained of pain in the region of the stomach, with constipation ; aperients were given, but the pain became more severe, and two days later he became pale ; vertigo and fatal syncope soon followed. The body was muscular and well nourished ; the heart and lungs were healthy ; the intestines were distended ; the peritoneum contained several pints of blood ; blood was also effused into the lesser omentum, into the mesentery, into the greater omentum, so also around the pancreas as far as the spleen. Dr. Wilks found a rupture of the hepatic artery near to the liver. The other vessels were quite healthy, so also the stomach, liver, spleen, kidneys, and intestines. It is probable that great muscular strain, or possibly a blow on the part, had to do with the rupture of the vessel ; and in many recorded instances the injury of the vessel has been referred to a similar cause.

As to the *duration* of abdominal aneurism, in some cases several years have elapsed after the first symptoms had been noted ; in one given by Dr. Gairdner seven years elapsed from the first attack of pain in the loins, when the urine was said to contain blood, and the death of the patient from dysentery. An aneurism existed at the diaphragm, and the vertebræ were eroded. Mr. Henry Thompson records an instance in which eight years elapsed from the commencement of the pain. After the onset of severe symptoms it is rare for life to be prolonged for even eighteen months to two years ; and after the formation of a manifest pulsating tumour, with severe and paroxysmal pain, the majority of patients die within three months ; still, in some cases the sac has become so laminated with fibrin, without obstructing the circulation, that the disease has remained passive ; this would seem to have been the case in an instance recorded by Mr. T. Holmes in the ' *Pathological Transactions*,' vol. vii. A man, æt. 69, died from dropsy, and an aneurism of the cœliac axis had not manifested any known symptom ; the sac was the size of the fist, and although filled with laminated and decolorised coagulum, the central part was soft, and it seemed that the current of blood to the branches of the cœliac, opposite to the opening of the aneurism into the aorta, was not obstructed.

*Treatment.*—The plan recommended by Valsalva has been

often tried ; but although the pain has sometimes been relieved, more frequently the relief has been very transient, and with diminished power there has been increased irritability. The method is thus described<sup>1</sup> :—" When Valsalva had withdrawn as much blood as was requisite, he ordered a progressive diminution of food and drink till the quantity was reduced to a determined weight of aliment and water. Having so far enfeebled the patient that he could scarcely raise his hand from the bed, on which he was ordered to lie from the beginning, the quantity of aliment was cautiously increased till that degree of strength was regained which warranted the patient to rise from bed." We cannot recommend this treatment ; it is well, however, to keep the patient in perfect rest, and to allow a sustaining but unstimulating diet. The bowels should be regulated by the mildest aperients, or by enemata ; and if there be arterial excitement, the mineral acids with tincture of digitalis will be found to be of service. Our efforts are often directed to the relief of suffering, for the paroxysms of pain are intense, and the patient is worn out by their severity and continuance. Opiates, morphia, and chloroform, are first resorted to, but are alike unavailing. Belladonna sometimes gives a little alleviation. When the tumour reaches the surface, the tincture of aconite may be applied externally ; and in thoracic aneurism I have seen this means afford very great relief. The tincture of aconite may, however, be used internally with prospect of some mitigation to the severity of the pain ; and although we may not be able to cure the malady, very much may certainly be done to diminish the severity of pain, and to prolong life.

#### *Aneurismal Tumours.*

CASE 1.—William K—, æt. 46. Aneurism of abdominal aorta. Pain in the back eight years before death ; severe symptoms five weeks. Rupture into cellular tissue of loin, then into the peritoneum. Heart healthy ; disease of the whole aorta. Pressure on the left renal artery.

CASE 2.—Thomas P—, æt. 52. Aneurism of the abdominal

<sup>1</sup> Cooke's 'Translation of Morgagni,' p. 492.

aorta at the cœliac axis. Pain in the back. No erosion of vertebræ. Rupture under and into the peritoneum. General disease of the aorta. Distension of aortic valves and regurgitation. Rheumatism. Ill about thirteen weeks ; symptoms of abdominal aneurism about seven weeks.

CASE 3.—Isaac T—, æt. 30. Aneurism of the abdominal aorta at the cœliac axis. Pain in the back. No erosion of vertebræ. Epigastric pain relieved by pressure. Heart healthy ; atheroma of aorta. Ill about four months ; first rupture into the peritoneum two days before death.

CASE 4.—Charles B—, æt. 34. Aneurism at the cœliac axis. Rupture into the peritoneum. Pain in the back. No erosion of the vertebræ. Heart healthy. Dysphagia. Dyspepsia. Ill four years ; constant and severe pain about three months.

CASE 5.—George W—, æt. 27. Aneurism of the abdominal aorta at the cœliac axis. Rupture into the peritoneum. Heart healthy. Erosion of the vertebræ. Ill three and a half months.

CASE 6.—Thomas B—, æt. 35. Aneurism of the abdominal aorta, on the right side. Intense lumbar pain. Pain over the thighs. Enlargement of the superficial veins. Pulsating tumour, systolic ; no bruit. Rupture into the right pleura. Ill about six months. Heart healthy.

CASE 7.—Thomas D—, æt. 38. Aneurism of the aorta at the diaphragm. Rupture into the cellular tissue of the left loin, behind the peritoneum, and into the left pleura, and among the abdominal muscles. Pain and swelling of the testicle. Heart healthy. Erosion of the vertebræ. Ill seven months.

CASE 8.—Andrew C—, æt. 21. Aneurism of the superior mesenteric artery. Rheumatic disease of the heart. Vegetations. Disease of the kidneys. Rupture into the subperitoneal tissue. Duration of aneurism not known.

CASE 9.—Edward B—, æt. 49. Aneurism of the abdominal aorta ; not recognised during life. Absorption of vertebræ. No pain. Large, mottled kidneys. Disease of the heart and aorta. Regurgitation through the aortic valves. Bronchitis.

CASE 10.—John C—, æt. 57. Double aneurism of the abdominal aorta, at the cœliac axis and superior mesenteric artery ; not recognised during life. Rupture into the peritoneum. Bright's disease. Dropsy. Disease of the aorta.

CASE 11.—John B—, æt. 35. Aneurism of the abdominal aorta. Rupture into the subperitoneal tissue.

CASE 12.—Harriet B—, æt. 23. Aneurism of the external iliac artery. Rupture into the cellular tissue. Pressure upon the bladder ; retention of urine.

CASE 13.—Mary S—, æt. 75. Dissecting aneurism of the aorta.

*Non-aneurismal but Pulsating Tumours.*

CASE 14.—John P—, æt. 52. Cancerous disease of the glands behind the stomach.

CASE 15. George G—, æt. 56. Cancerous disease at the pyloric extremity of the stomach. Adhesions. Pulsation. Simulation of aneurism.

CASE 16.—Mr. G—, æt. 53. Suppuration in the lesser omentum. The abscess localised, and undermining the coats of the stomach. Pressure on the first portion of the duodenum, and symptoms of organic disease there. Pulsating tumour from pressure on the large vessels.

CASE 1.—*Aneurism of abdominal aorta ; rupture into peritoneum.*

William K—, æt. 46, was admitted into Guy's, September 6th, 1860, under Dr. Habershon's care. He was a married man, of temperate habits, and he had been employed at the military stores ; his residence at Lambeth. About eight years ago,

after running a race, he had a severe fall, and said that he was never "afterwards strong in his loins," but had pains in his back. Three weeks before admission, after exposure to cold and wet, he was seized with vomiting and purging, and became very prostrate. The more severe symptoms were checked, but he was not able to return to work, in consequence of pain in the abdomen. He was a tall, large man, but thin, anæmic, and with an anxious, distressed countenance. There was no evidence of cerebral or of thoracic disease; the pulse was compressible; the skin dry, the tongue moist and clean. The abdomen was rather tumid, resonant, and painful in the left lumbar and left iliac region; a tolerably defined hardness could be felt in the course of the descending colon and sigmoid flexure. There was no anasarca, and the urine was of a healthy character. The bowels were confined. He was ordered to remain quiet in bed, to take saline rhubarb powder, and, if necessary, to have a castor-oil injection; allowed beef-tea and arrowroot. 8th.—The castor oil injected acted freely, but the pain in the abdomen at the left lumbar region was very severe. To take *Pil. Saponis cum Opij*; gr. oiss, night and morning. Julep of acetate of ammonia three times a day. 15th.—Hardness and fulness in the whole of the lumbar region, extending to the anterior part of the abdomen, and reaching inwards at the upper part nearly to the umbilicus. There was resonance over the tumour at the time of admission, but the resonance has now lessened; the bowels were opened on the 13th by injection. 19th.—The pain very severe. To take gr. j opium, night and morning. 22nd.—The tumour is much larger, more dull on percussion, and extending to the median line from the loin; it now can be seen altering the form of the anterior parietes. 24th.—The tumour rapidly enlarging; the surface of the abdomen is tense. The patient is anæmic, prostrate, and distressed; the pain continues exceedingly severe, and he is unable to obtain rest at night. Repeat the opium, and to take chloroform draught every night. 29th.—Pain intense. October 1st.—Tumour attains very large size; the pain is as severe as before, and the mass now pulsates distinctly. The patient is anæmic, distressed, and very ill. 10th.—The pain less severe, but the tumour continues to enlarge; there is anæsthesia in the course of the anterior cutaneous, genito-crural, and external cutaneous nerves of the thigh. 17th.—The tumour fills nearly half the abdomen; pulsation distinct and uniform; the whole tumour heaves; no bruit audible; the pulsation in the left femoral scarcely perceptible; that of the right distinct. Pain still very severe. Takes light, nourishing food; unwilling to apply ice to tumour. 20th.—Constant moaning from the agonising pain. On the 21st, after constant suffering, called to nurse, and said that he was dying, and in a few minutes became insensible, and died.

*Inspection*, October 22nd, 1860.—Head not examined. Lungs and pleura healthy. Heart and valves normal. *Abdomen*.—The peritoneum contained about two pounds of clot, which had escaped from a rent on the anterior aspect of a large aneurismal tumour, occupying the whole of the left side of the spine, and extending from the diaphragm to the iliac fossa. In front, and a little to the right, was the descending colon, pushed forwards, and empty and contracted. The left kidney was thrown forwards and upwards; it was pale, atrophied, the renal artery much diseased, and at its commencement in the aorta almost obliterated. The spleen and other viscera and glands were healthy, but pale. The aneurism was situated behind the transverse fascia of the abdomen; there was a large oval communication, about two inches long, with the aorta, immediately beneath the diaphragm; the bodies of the first



and second lumbar were extensively absorbed, and the intervertebral substance irregularly projected; the blood had burrowed beneath the fascia, forming a very large false aneurismal tumour; it was lined with dense layers of fibrin, and it was impossible to say precisely how far the lining membrane of the aorta had extended. The tumour contained several pounds of coagulum. The lining membrane of the aorta was extensively diseased; rough, scabrous, and ossific, in some parts destroyed; the disease diminished in the thoracic aorta, and was least near the valves. Other viscera healthy.

In this case the pain in the back came on eight years before death, after great muscular exertion, and we believe that this was the commencement of his fatal malady. It was, however, not till five weeks before death that he was seized with vomiting and purging, and became anæmic and prostrate. On admission, these choleraic symptoms had subsided, but he was very weak and ill. There was severe pain in the left hypochondrium and left loin, and ill-defined swelling could be felt in the course of the descending colon. There was resonance on percussion, and no pulsation could be felt; in this state, from the violent vomiting and purging, I was led to regard the disease as connected with the descending colon. After a very short time, however, the false aneurismal sac extended beyond the strong fascia of the abdomen, the kidney was pushed forward and its artery compressed; the left iliac fossa became distended; pulsation then was distinct, and the true character of the complaint was apparent. The pain was situated in the position of the tumour, and was especially felt in the left hypochondrium; it was very intense, and scarcely relieved in any degree by opiates or by chloroform. No bruit could be heard after repeated examination. Rupture took place first into the cellular tissue, leading to great pallor and weakness, then into the peritoneum, when fatal syncope ensued. This instance also shows the great difficulty in forming a correct diagnosis at the early stage of aneurismal disease, especially when the sac is situated behind a strong investing membrane.

*CASE 2.—Aneurism of the abdominal aorta, celiac axis; pain in the back; no erosion of vertebræ; rupture under and into the peritoneum; general disease of aorta; distension of sinuses of Valsalva; regurgitation; rheumatism.*

Thomas P—, æt. 53, was admitted under Dr. Barlow's care, April 23rd, 1862, and died on June 25th. He had been a labourer at Tilbury; a short, but strongly

built man. When twenty years of age he had ague, and five years before admission he was laid up with rheumatism; the joints were then swollen. He had drunk freely, and although he had enjoyed good health, he had always been short-breathed. A short time before his last illness he had been working at the fortifications near Tilbury; and about five weeks before admission he was taken ill with dyspnœa, so that he could not lie down; this symptom continued till his application at the hospital. Then the dyspnœa was severe at night, disturbing his sleep. The left leg was swollen, so also the scrotum; the bowels were confined; the appetite tolerably good; the urine was scanty, but free from albumen. The heart's action was regular, and there was a double bruit, heard most distinctly at the upper part of the sternum, and faintly in the axilla. The pulse was full and regular. On the 5th of May he complained of pain at the region of the stomach and in the loins; worse when in bed. He had nausea and loss of appetite. On June 20th the pains in the back and upper part of the abdomen were severe, and there was pulsation felt in the epigastric region, a little to the left of the median line; it was distinct to the eye. The abdomen had been frequently examined, but this state had not been previously observed. On the 22nd the pulsation was more evident and stronger, and the pain worse. On the 24th the pain was still severe, and a bruit was audible. On the 25th sudden severe pain came on at the upper part of the chest about midnight, and at 5 in the morning he died.

*Inspection*, by Dr. Wilks.—The heart was somewhat enlarged. The left ventricle was dilated and hypertrophied. There had probably been endocarditis at some former period, as the whole serous membrane was opaque. The aortic valves were slightly thickened, but appeared quite perfect. The whole of the aorta was much diseased, both in its ascending and descending parts; the coats were thickened and atheromatous above the aortic valves; at the three pouches or sinuses the vessel was thinner and distended, so as to prevent closure of the valves. In the abdomen there were several pounds of coagulum, and this had proceeded from the rupture of an aneurism situated on the left side, and above the stomach. On removing the viscera, the blood was found to have extravasated to a great extent under the peritoneum; also along the cellular coat of the aorta upwards into the chest, so that the thoracic aorta was seen to be surrounded by a clot, and the false aneurism was on the point of bursting through the pleura on the right side. The aneurism was the size of a duck's egg, and situated at the front and left side of the aorta, near the fissure of the spleen. It was connected with the aorta by an opening the size of half-a-crown, which appeared to be a dilatation of the natural opening of the cœliac axis. The walls of the aneurism were thin, and on examining the interior it was evident that several ruptures of the internal coat had from time to time occurred; thus it was fissured in several places, the edges being smoothed off, and the gap filled by the thickened external coat. In some places this stretching had occurred to such a degree that mere isolated spots of serous membrane remained amongst the fissures on parts corresponding to the cellular sheath of the artery. The kidneys were healthy.

This case presented many points of interest. Several years before death he had had an attack of rheumatism, leading to swelling of the joints; this in itself would predispose to cardiac

disease, and it was evinced by the opacity of the endocardium, the effect, probably, of early endocarditis. His intemperate habits would still more predispose to arterial disease, and a third and powerful exciting cause of arterial distension was the great muscular exertion to which his employment subjected him. This effect was shown in the great distension at the commencement of the aorta; the sinuses of Valsalva were so stretched that the aortic valves did not come into contact, and regurgitation took place; the usual symptoms of aortic regurgitation were manifested, and thus also were produced the dyspnœa and distress for which he was admitted.

It is unusual to find abdominal aneurism with cardiac disease; and when aortic regurgitation exists, the pulsation in the abdominal aorta is often so increased as easily to lead to fallacious diagnosis. About seven weeks before this patient's death, on May 5th, he began to complain of pain in the back and in the epigastrium; but it was not till about six weeks later, June 20th, that a pulsating tumour could be felt in the epigastrium. The pain in the back was severe, but there was no erosion of the vertebræ, thus confirming the remarks of Dr. Stokes, that although erosion of the vertebræ is generally present, pain in the back may occur without it. The aneurismal sac was not large, and was situated deeply down in the front and on the left side of the aorta towards the spleen. It was at the cœliac axis, and the inner coat of the artery was fissured in several places to a remarkable extent. The sac had given way in front, and extravasation took place, first into the subperitoneal tissue and around the aorta; the aorta was, indeed, surrounded by coagulum, extending upwards into the posterior mediastinum, and in a short time rupture would have taken place into the left pleura. The peritoneum, however, first gave way, and death took place after several hours of severe pain.

*CASE 3.—Aneurism of abdominal aorta, cœliac axis; pain in the back; no erosion of vertebræ; rupture into the peritoneum.*

Isaac T—, æt. 30, admitted into Guy's Hospital January 16th, 1861, and died on the 23rd. He was an excavator, who had resided in Kent Street. Three or four months before admission he began to suffer from pain at the bottom of the back;

and six weeks later the pain became severe, and was also felt in the abdomen. The bowels were open every day. On admission he was sallow, melancholic, and emaciated; there was severe pain over the whole of the abdomen, and there was also a "catching" pain in the epigastric region, which was increased by the patient lying upon the side; hence he was compelled to lie upon the back. The pain in the abdomen, as well as in the back, was relieved by pressure. The abdomen was full, soft, and tympanitic; a distinct hard, rounded, mass, about one and a half to two inches in diameter, and freely movable, could be felt in the left iliac region (scybala). There was dulness a little below the ribs in the right hypochondrium. The respiratory and cardiac sounds were normal; the tongue furred and moist; the pulse 54, and compressible. The appetite bad. *Ol. Ricini* ʒss, *Tinct. Opii* mxx, to be taken at once. On the 17th the castor oil, followed by a soap injection, had brought away scybulous masses, and the iliac swelling had disappeared. On the 18th he seemed more comfortable, but on the 20th he was in considerable pain, and *mx* of tincture of opium were given, and a castor-oil draught, as before, was also administered. On the 21st he was seized suddenly with extreme pain, and he became delirious, and raved for several hours, writhing with agony. He voided a large quantity of feculent matter, but no blood. On the 22nd he was very ill, and blanched. Pulse 116, and feeble; the tongue flabby, furred, and moist; the lower part of the abdomen distended, and resonance imperfect. Calomel and opium, of each gr. j, were given every four hours. On the 23rd he died suddenly at 11 p.m., sensible till death.

*Inspection.*—The abdomen was filled with clotted blood, and the blood appeared to proceed from the sac of the lesser omentum, which was also distended with clot. There was a small aneurism of the celiac axis, two inches by one and a half. The three vessels came from the sac. A small, ragged opening existed at the anterior and upper part. The crura of the diaphragm were adherent. The inner coat of the artery was continuous over the inner surface of the sac, which contained very little fibrin. The spleen contained fibrinous masses. The kidneys were pale. The urine had contained a small quantity of albumen during life. The heart was normal as to size, and the valves healthy, but there was a good deal of atheromatous deposit.

The cause of the disease in this case was apparently muscular exertion, as an excavator. About four months before death pain in the lower part of the back came on; this increased in severity, but the principal complaint was of "catching" pain at the epigastrium; the pain was *relieved by pressure*. A movable mass was felt in the abdomen, which, however, was removed by the action of castor oil and by enemata, showing that it consisted of fecal collection in the bowel. The pain in the back continued, but there was no erosion of the vertebræ; the more severe pain arose from stretching of nerve-filaments, where they surround the celiac axis, but no pulsating tumour was felt. Two days before death rupture took place; the patient became blanched; intense pain came on in the abdomen, and delirium for a time supervened. Fresh hæmorrhage led to

fatal syncope. The character of the pain was quite that of aneurism, but without any evidence of pulsating tumour. Many would have hesitated to have given a definite opinion as to the malady; for the relief of the pain by pressure simulated lead colic.

**CASE 4.**—*Aneurism of the abdominal aorta, cæliac axis; rupture into the peritoneum.*

Charles B—, æt. 34, a porter, was admitted into Guy's Hospital, under Dr. Addison's care, November 20th, 1854. He had resided in Tooley Street, and in his daily work he had been accustomed to carry heavy weights upon his back. Four years before admission he had observed pulsation under the ensiform cartilage, and pain was experienced at that part after eating; the pain and swelling, from which the patient suffered at those periods, lasted three or four hours. One year later, three years before admission, he strained his back, which compelled him to give up work for one week. At the end of eight months the pain returned so severely that he was compelled to give up laborious work. He then obtained some light occupation, and several months before his application at Guy's the pain in the back had ceased; but three months prior to that time pain commenced in the middle of the back, from the sixth to the twelfth dorsal vertebra, and passed round the right side, in the course of the intercostal nerve. For three weeks he had had dysphagia. He had emaciated slightly; there was a pulsating tumour beneath the ensiform cartilage, and a systolic bruit was audible over it, or rather a bruit immediately after the systole of the heart; the pulse was 64; the bowels open. On November 24th he passed a restless night, from the severe pain in the right side; the bowels had not been open for two days. He was ordered ʒss of castor oil, and sulphate of magnesia mixture, with ʒss of the compound tincture of camphor, twice a day. On the 25th he again had a restless night from pain. On the 26th he had been walking about the ward as usual, but at 10 p.m. was found sitting up in bed, gasping for breath, and in a few minutes he died.

*Dr. Wilks's report of the inspection.*—The body was that of a strong and moderately nourished man. On passing the hand along the back, there appeared to be a slight projection of the last dorsal and upper lumbar vertebræ; and on examining the bodies of these vertebræ anteriorly, irregularity was also found. The second lumbar vertebra appeared to project forward more than the other, and consequently the first seemed depressed. This state was not discovered during life, and it was quite impossible for the aneurism to have had anything to do with its production, as the disease of the vessel was in front. The lungs and pleuræ were healthy. In the pericardium there were about ʒiij of serum; the heart was of natural size, and firmly contracted; all its cavities were empty, and the left ventricle and the mitral columns were slightly hypertrophied; the endocardium and the mitral curtain were both opaque, and there was a white patch on the tricuspid. The aorta was healthy, and free from atheroma. The coronaries were healthy. *Abdomen.*—The peritoneum contained three to four pints of coagulated blood. There was moderate post-mortem solution of the stomach. The liver was healthy, three pounds in weight. On raising the liver, a tumour (aneurism) was seen between the liver and the stomach; it was about the size of a hen's egg, and was situated at the origin of the cæliac axis. The aneurism was aortic, and it was at the origin of the cæliac axis, the trunk

of which was given off just within the sac, towards its left side. The opening of the cœliac axis appeared at first sight to be enlarged to about four times its natural size, and of an oval form, but this was really aortic dilatation. The aorta above and below was healthy. The aneurism contained recent clot, but the sac was thin and flabby, and blood had evidently circulated in it during life. There was a rent on its anterior surface, one third of an inch in length, through which the blood had passed, and considerable fibrous thickening in the neighbourhood of the aneurism had led to adhesions with the liver and stomach. The aneurism was directed towards the right side, and at its base were the semilunar ganglia and their branches, so that the sac was covered with nerve-filaments.

This patient had been subjected to great muscular exertion, and four years before his death he noticed pulsation at the ensiform cartilage. The aneurism possibly existed then; several times afterwards pain came on in the back, but ceased when he rested; and it was not till three to four months before death that constant pain, from the sixth to the twelfth vertebræ, came on; but this was not due to erosion of the vertebræ. In the post-mortem report no mention is made of such a lesion. There was also severe pain in the right hypochondrium. Another symptom, not usually observed in abdominal aneurism, was present here, namely dysphagia; and it is probable that the aneurismal sac exerted slight pressure upon the duodenum, for pain was experienced three to four hours after food had been taken.

The aneurismal sac was small, it was situated at the cœliac axis, and was directed towards the right side. During life it was felt as a pulsating tumour, and a bruit was heard directly after the systole of the heart. The fatal rent in the sac took place on its anterior surface, and the patient died, as far as could be ascertained, within a few minutes after the effusion of blood into the peritoneal cavity.

**CASE 5.—*Aneurism of abdominal aorta at the cœliac axis; rupture into the peritoneum.***

George W—, æt. 27, admitted into Guy's Hospital, under Dr. Wilks's care, June 30th, 1858, was an omnibus-conductor, of irregular habits, who had had syphilis, and scars were found in the groin. About three months previously he began to experience a beating in the abdomen, and suffered from rheumatic pains in his back and sides, and three weeks before admission he observed a tumour. He had often had vomiting in the morning. He was not accustomed to any inordinate exertion, and he could not attribute his disease to any cause.

On admission he was a pale, spare man, complaining of pain in his back, and

occasionally around the abdomen. A projecting tumour, a little to the right of the scrobiculus cordis, was felt, pulsating with considerable force. A bruit was heard on applying a stethoscope, and behind a slight continuous bruit was audible. He died suddenly on July 11th, and the tumour was felt to have subsided.

The chest was healthy; the left ventricle was firmly contracted and empty. The abdominal cavity contained several pounds of coagulum in its posterior part and in the pelvis. A tumour—the aneurism—was seen projecting above the lesser curvature of the stomach, beneath the edge of the liver; its upper part had burst. It was not larger than a duck's egg, formed at the celiac axis, but it did not involve that vessel, for the opening was at the side of the aorta. The arteries came off from the right side, and on the left was the aneurism, which extended both backwards and forwards, and thus the bodies of two vertebræ were partly absorbed, at the same time that a tumour was formed anteriorly. The vessel above and below was healthy. The liver, kidneys, and alimentary canal, were healthy.

No cause could be found for the aneurismal disease in this case. The first symptoms arose about three and a half months before death, and the pain in the back was attributed to rheumatism. Three weeks prior to his admission a pulsating tumour was found in the abdomen, and a bruit was audible; the vertebræ were partially eroded. The death of the patient was exceedingly sudden, and apparently without his having made any exertion to produce rupture of the aneurism.

*CASE 6.—Aneurism of the abdominal aorta, opening into the right pleura; erosion of vertebræ.*

Thomas B—, æt. 35, a hatter, residing in the Southwark Bridge Road, was admitted on August 13th, 1862, under the care of Dr. Barlow. He had always enjoyed good health, and had been a very steady man. He was quite well five months ago, but soon after that time he began to suffer from rigors, pain in the right side and in the back, which passed down to the inner side of the thighs. The pain gradually became more severe, and he rapidly lost flesh. August 13th.—He was very thin and emaciated, pale, and as if he had suffered much pain. He felt an intense pain in the right lumbar region, and in the back and groin, down into the inner part of the thighs, the superficial veins of which were very much enlarged. The muscles of the abdomen were tense, and very firmly contracted, and the least pressure caused great pain. There was a strong pulsation in the right lumbar region, about the region of the kidney, but no aneurismal bruit could be heard, and the muscles were so tense that no tumour could be felt. The urine was quite healthy. Lungs and heart seemed quite normal. Pulse 96, rather feeble and small. He felt rather sick at times, especially after his food. Had no headache. Bowels well open; tongue clean. Ordered—Potass. Bicarb. gr. xv, Potass. Iodid. gr. iij, Tr. Hyoscyam. mxx, ter die sum.; Pulv. Ipecac. co. gr. viij omni nocte. 16th.—The pain was not quite so severe to-day, but the abdominal muscles were very firmly contracted. Felt very sick at times, but he had not vomited. To omit the iodide of potassium. 19th.—The pain very severe. The pulsation was very strong, but no

aneurismal bruit could be detected. Chloroform liniment to be applied daily, 22nd.—Felt very sick at times; pain very severe, so that he could not sleep. To have Mist. Oleosa c. Mannâ c. Tr. Opii  $\text{m}\nu$ , ter die; Pulv. Ipecac. co. gr. viij, horâ somni omni nocte. 26th.—Pain was much worse; there was still no bruit—Lin. Bel-ladonnæ  $\text{ʒij}$ , Chloroformyl  $\text{ʒss}$ , ft. linimentum. September 1st.—Not so well again. There was apparently a good deal of irritation to the bladder; Mr. Stocker saw him, and requested the house-surgeon to examine him.—Acid. Nit. dil.  $\text{m}\nu\text{ij}$ , Morph. Acet. gr.  $\frac{1}{2}$ , ex aq., p. r. n. 3rd.—Still suffered very severely from the pain. Did not take his Mist. Oleos. c. Mannâ, because it produced nausea, but has taken his morphia draught twice in the day. 4th.—Was in very acute pain. Ordered—Liq. Morph. Acet.  $\text{m}\nu$ , ex Mist. Camph., ter die; rep. liniment. To be kept exceedingly quiet. 6th.—In very great pain again to-day, especially down the inside of the left thigh. The pulsation could be felt very strongly behind, in the right lumbar region; slightly in front, as high as the eighth rib, and as low down as the crest of the ilium; it was synchronous with the pulse. The femoral arteries both pulsated equally. There was no aneurismal bruit, and no distinct tumour could be felt, though there was an indistinct margin about one inch above the crest of the ilium; this margin was absent on the other side, so that it did not appear to be muscular. His bowels were not open. 8th.—Died suddenly this morning. At 2 o'clock a.m. he said he felt a great deal easier, and was talking, but, at 6 a.m. he was found dead.

*Post-mortem*, 2.30 p.m.—The body was very blanched. A slight, indistinct mass can be felt in the right lumbar region. On opening the abdomen nothing abnormal was seen, but there was an enormous quantity of clotted blood in the cavity of the right pleura, pressing the right lung, but none at all in the left. The right kidney was pushed outwards and forwards (the lower margin corresponding to which could be indistinctly felt externally during life).<sup>1</sup> Underneath the kidney there was found an enormous aneurismal sac, opening out of the aorta at its posterior part, and involving nearly its whole length; it extended on the right side into the iliac fossa, under the psoas, and up to the diaphragm, through which there was an opening, where the aneurism had burst and discharged its contents into the pleura. The bodies of the vertebræ were very much destroyed. At the bottom of the sac two smaller sacs were found, which were filled with coagulated fibrin, disposed in layers. There was a good deal of fluid in the pericardium, and a white patch on the heart; the valves were healthy. The left lung at the base had lost its spongy structure, and become carnified. There was nothing in the bladder. The liver rather enlarged, but no structural change. Gall-bladder quite empty.

The symptoms of aneurism were of about five months' duration when this patient was admitted, and he lived nearly a month afterwards. Intense pain came on, and extended over the thigh; the superficial veins were enlarged; this arose from the sac pressing on the right side, so as to interfere with the circulation in the cava; and in other similar instances it has been observed that the superficial veins are more likely to be enlarged when the aneurism exists on the right



than when it is found on the left side. A pulsating tumour was present, but the pulsation was systolic; no bruit could be heard. A short time before death he said that he felt much easier, probably because the tension in the sac had been lessened.

**CASE 7.**—*Aneurism of the aorta at the diaphragm; rupture into the cellular tissue of the left loin behind the peritoneum, and into the left pleura; extravasation among the abdominal muscles.*

Thomas D—, æt. 38, was admitted February 14th, 1855, under Dr. Addison's care. He was a wood-carver, residing at Westminster, and although he had never undergone any very hard work, still, when young, he had frequently taken violent exercise in boating. Six months prior to his admission into Guy's he began to feel pain in his back; the pain passed over the hips to Poupert's ligament, and also towards the front of the abdomen; there had been some pain and swelling of the left testicle. He had entered St. George's Hospital, where, he stated, his case was considered as one of calculus in the kidney or ureter. He was a short man, weakly in appearance, and with a haggard countenance. There was pain in the back and in the left side, but it was not well defined; pain also in the bowels, with flatulence; a slight pulsation could be felt and seen on the left side at the cartilage of the seventh rib; an indistinct bruit, not synchronous with the pulse, could be heard. There was no cough; pulse 92, not compressible; bowels were irregular. The sleep was disturbed; the urine was abundant; the bowels were acted on by magnesian medicine, with tincture of henbane. The pain increased in severity; there was swelling in the back, at the lower part of the chest, on the left side, and pulsation could be clearly seen. In front, the abdominal muscles were rigidly contracted. On March 9th he was not so well, and on the following morning, at 5 a.m., died suddenly.

*Inspection* was made fifty-eight hours after death (*Dr. Wilks's report*).—The body was wasted. The head was not examined. The trachea was healthy. The left side of the chest was seen to be full of serum, with a clot of blood at its lower part. The lung was compressed, being only adherent by a single adhesion at the apex, and by others at the base, so that the left side of the chest was quite full of blood; the clot weighed 2 lbs. 9 oz., and the serum measured three pints. On removing these, a tumour was seen occupying the position of the aorta, as it passed through the diaphragm. The base of the lung, at its inner edge, was adherent to it, and at this part the aneurismal tumour had given way, pouring its contents into the cavity of the chest. On looking into the right side of the chest, the other side of the tumour was seen at the base of the lung, and slightly adherent to it. The pericardium was healthy, and contained about 3ij of serum. The heart was of natural size; empty; weight, 7 oz. The left ventricle was closely contracted; the valves were efficient, but slightly atheromatous; the muscular fibre was healthy, so also the coronary arteries; the aorta presented slight atheroma. *Abdomen*.—On removing the integuments ecchymosis was seen in the abdominal walls, and on cutting through these, blood was

found extravasated between the muscles below the umbilicus. In the interior of the abdomen a large, dark mass was seen, occupying the left lumbar region and the pelvis, and this was due to a quantity of effused blood or fibrin behind the peritoneum. There was a clot behind, and surrounding the kidney, and in the course of the ureter and psoas muscle. The clot was made up of fibrinous layers, some nearly decolorised, and evidently of slow deposition. The stomach contained much mucus, but was healthy. The small and large intestine were also healthy; the ileum contained much mucus. The liver was rather fatty; weight, 2 lbs. 12 oz.; spleen healthy; its weight, 7 oz.; its capsule was covered with dense fibrinous deposit, and was adherent to the diaphragm; the pancreas was healthy. On removing all the viscera, and leaving the diaphragm, the situation and extent of the aneurism could be seen; it occupied the situation of the aorta, as this vessel passed through the diaphragm; and it was for the most part of an oval form, of about five inches long and three broad; one half of it was above, the other below, the diaphragm. At its left side and lower part it was not distinctly defined, being continuous with a mass of fibrin running down the psoas muscle. On removing the whole tumour, the walls of it, as above defined, were found not to be those of the aneurism itself, but they consisted of fibrin covered by the diaphragmatic muscle and serous membrane. The original walls of the aneurism could be traced only a slight distance beyond the aperture of the sac. This aperture was situated exactly in the median line, at the posterior part of the aorta, and half an inch above the celiac axis; it measured one and a half inch in diameter, and the margins were round. The vertebræ were exposed at the back, and the tumour, as first seen, was formed by a mass of fibrin passing upwards and downwards. On cutting the mass from the spine no proper sac was traceable, and the bodies of the two last dorsal and the first lumbar vertebræ were carious. A quantity of fibrin lay close on these bones, and so left no vacant space, or empty sac. The peritoneum was ready to give way in numerous places. The fibrin in the false aneurism was continuous with that effused into the abdomen, and at a little above the place of meeting it had given way into the chest.

In this patient violent exercise in earlier life appeared to have induced disease, which did not manifest itself till a later period; the severer symptoms were of seven months' duration; pain in the back was the earliest symptom, and it extended to the front of the abdomen, and down to the hip. The pain and swelling of the testicle led to the supposition of renal disease; at a later stage the diagnosis was clear. He had a wasted and haggard expression, and a pulsating tumour became developed in the left hypochondrium; the bruit was not perfectly synchronous with the systole of the heart. Death took place suddenly, from rupture into the left pleura, but blood had been slowly extravasated into the left loin; old fibrin was found behind the left kidney and in the course of the ureter, accounting for the renal irritation. The vertebræ were eroded.

The aneurism was situated at the diaphragmatic portion of the vessel, and the sac extended both above and below the diaphragm.

**CASE 8.**—*Diseases of the heart and kidneys; uræmic convulsions; aneurism of the mesenteric artery; rupture into subperitoneal tissue.* (From post-mortem report by Dr. WILKS.)

Andrew C—, æt. 21, was admitted June 1st, 1859, under the care of Dr. Gull, and he died October 9th. He had had rheumatism, and came to the hospital suffering from a subacute attack, with disease of the heart, involving the aortic valves; subsequently the urine became albuminous. He had no dropsy, and was able to walk about. Shortly before death he had several uræmic fits, and at last died rather suddenly.

*On inspection*, the body was spare. The brain was pale and watery; its vessels were healthy. The pleura and the lungs were healthy, so also the pericardium. The heart was slightly enlarged. The aortic and mitral valves were covered with vegetations; from the former there hung large masses of fibrinous deposit and recent coagulum, and the whole endocardium and anterior curtain of the mitral were covered with vegetations; these were also between the cords, and united them together. One of the aortic valves was retroverted. On opening the abdomen, the intestines were seen to be pushed forward by a large quantity of blood effused into the mesentery and behind the peritoneum. The blood amounted in quantity to two or three pounds, and it was confined to the mesentery, not having passed upwards or downwards into the pelvis. On examining the aorta and its branches, the source of the blood was seen to be an aneurism of the superior mesenteric artery, about two inches from its origin, and about the size of a pigeon's egg. The aneurism had in it a large rent on its anterior surface, half an inch in length; at its lower part a small vessel was seen at its continuation. The walls of the sac were very thin, and it contained a thin, fibrinous layer. The liver was very fatty. The spleen was occupied by numerous fibrinous masses, about half the organ being filled by them. They were softened into a fluid state. The artery was free. The kidneys were pale and large, and they were in an early condition of Bright's disease; both of them contained fibrinous masses, although of less recent date than those in the spleen; some of them were contracted, so as to produce depressions on the surface.

This case was one of great interest, but also of obscurity. The presence of rheumatism with aortic regurgitation tended still further to conceal the true character of the malady; and subsequently the albuminous character of the urine, and the epileptiform convulsions, seemed to afford ample cause for the sudden termination. The post-mortem examination revealed a rare and an interesting coincidence, namely, aneurism of the mesenteric artery, and its rupture into the subperitoneal tissue. The aortic and mitral valves were covered with vegetations,

and it has been suggested that the obstruction of the vessel by a fibrinous coagulum might have tended to the formation of the aneurism.<sup>1</sup> The state of the kidneys was different from that usually observed in cardiac disease; instead of being congested, they were pale and in an early stage of Bright's disease. In some cases of aneurism of the aorta, when the renal vessels have been compressed or its nerves irritated, the kidney has seemed to be involved by secondary disease either of a functional or organic character; but no such connection could be made out in this instance.

**CASE 9.**—*Large mottled kidneys; disease of heart and aorta; regurgitation through the aortic valves; bronchitis; aneurism of the abdominal aorta, not recognised during life; absorption of vertebrae; no diagnostic pain.*

Edward B—, æt. 49, was admitted under Dr. Addison's care, October 17th, 1855. He had been a wine and spirit porter, and for twenty-five years had been accustomed to drink beer, wine, and spirits; sometimes he had been intoxicated for several weeks together, and he had had attacks of delirium tremens. For five or six years he had had winter cough; he had also suffered from gout, and from general dropsy. On admission into Guy's he was anasarcaous; bronchial râles were heard generally in the chest; the urine was scanty, and it contained a large quantity of albumen, with casts of uriniferous tubes. In the course of the aorta, and over the region of the aortic valves, there was a double bruit, and the pulse was one indicative of aortic regurgitation. The dropsy in great measure subsided, and the patient was relieved, but on the occurrence of severe weather the bronchitis increased, and he died rather suddenly.

*On inspection*, the body generally was anasarcaous. There was no arcus senilis. The right pleura was universally adherent with old adhesions; the left was only partially adherent, and contained about a pint of serum. The bronchi were full of tenacious mucus, and the tubes were thickened. In the upper part of the lung there were cretaceous and soft deposit, and the induration of chronic pneumonia. The heart was enlarged in all its cavities; 14 oz. in weight; both ventricles were also hypertrophied. The aortic valves were thickened, and the whole of the aorta was very much diseased, and its surface was covered with long, scabrous, bony plates. The peritoneum contained a small quantity of fluid. The intestines, the liver, and the spleen, were healthy. The weight of the liver, 3 lbs. 14 oz.

The abdominal aorta was, as the thoracic, very much diseased; its whole surface was covered with semi-detached bony plates. Immediately below the cœliac axis was a small aneurism an inch in diameter. The posterior walls of the sac were destroyed, and the vertebrae superficially absorbed. The kidneys were large and mottled, the whole of the cortical structure was full of white deposit; one was rather wasted, and contained a few cysts; weight, 11½ oz.

---

<sup>1</sup> Dr. Ogle and Dr. Wilks, in 'Pathological Trans.'

Two causes of arterial disease were present in this case—in-temperance, and excessive muscular exertion; but these exciting causes of disease had induced more general mischief, for degeneration of the kidney, and its attendant symptoms of anasarca and bronchitis, were also developed. Dr. Stokes has made the remark that in abdominal aneurism of the aorta, the thoracic aorta and the heart are generally unaffected; and although that observation is true in most cases, still in the instance before us the whole of the aorta was rough and scabrous, there was regurgitation through the aortic valves, as in the last case, and all the cavities of the heart were hypertrophied; here, also, the vertebræ were superficially absorbed, but there was no diagnostic pain. The aneurism itself was small, it was situated immediately below the cœliac axis, but if life had been prolonged, it is probable that more manifest symptoms would soon have presented themselves. The dyspnoea from the bronchitis tended still further to obscure the abdominal affection; and bronchitis was the most prominent symptom during life, as well as the immediate cause of death.

**CASE 10.**—*Double aneurism of abdominal aorta at the cœliac axis and superior mesenteric artery, not recognised during life; rupture into peritoneum; Bright's disease; dropsy; disease of the aorta.*

John C—, æt. 57, admitted under Dr. Addison's care, October 8th, 1857, and died October 16th. He was affected with symptoms of chronic Bright's disease, œdema of the legs, &c. About ten minutes before his death he complained of great pain in the abdomen, and the nurse applied a warm poultice; he was soon afterwards found dead. The thoracic viscera were healthy; the kidneys were white, larger than usual, and presented cysts on the surface. On opening the abdomen, several pounds of coagulum were found in the abdomen. On removing these an aneurism was seen, as large as a goose's egg, beneath the colon, and having the pancreas stretched across it; a large rent was observed on its anterior surface, to which shreds of lymph adhered. Upon removing the aorta, it was found that two aneurisms existed, and it was the lower one which had burst. These sacs had formed entirely on the anterior part, so that the posterior wall of the vessel was perfect, and the spine quite uninjured. On slitting open the vessel, two openings were seen, each about the size of half-a-crown, with a slender piece of the vessel passing as a band between them; the two sacs were quite distinct, and about an equal size, each about the size of a hen's egg. The aneurisms were found at the origin of the cœliac axis and superior mesenteric artery, so that the arteries came off from the sacs; those of the former ran along on the surface of the upper aneurism, and the mesenteric came off from the lower. In both the passage was partly closed by coagula. The aorta above and below was considerably diseased, and at the arch were several small pouches.

**CASE 11.—*Aneurism of the abdominal aorta; rupture into the subperitoneal tissue.***

John B—, æt. 35, was admitted on February 1st, 1862. He had a healthy appearance, but there was a pulsating tumour in the abdomen, with bruit, and with pain in the left hip. He died suddenly.

The lungs and heart were healthy. On opening the abdomen a large mass of blood was seen through the mesentery. A large clot was found beneath the peritoneum and in the left loin. A large, oblong aneurism existed between the crura of the diaphragm; the celiac axis and the superior mesenteric and the left renal arose from it, the right was below it; the aneurism involved a large part of the abdominal aorta, and on its left side, just below the renal, was a long rent. The liver and kidneys were healthy.

The brief and imperfect record of this case is given as an exemplification of the fact, that although an extensive aneurism of the aorta existed, the patient had a healthy appearance. The aneurism involved a large portion of the abdominal aorta, from the crura of the diaphragm to the left renal artery.

**CASE 12.—*Aneurism of the external iliac artery; rupture into cellular tissue; pressure upon the bladder; retention of urine.***

Harriet B—, æt. 33, was admitted into Guy's Hospital March 17th, 1850, with retention of urine; she stated that a few days before she had sustained some injury, and that her abdomen had been contused. There was not, however, any bruise in that region. From the appearances about the vagina, it was supposed that she laboured under malignant disease, and that a tumour pressed upon or involved the meatus, and prevented the flow of urine. A catheter was with much difficulty passed, and much urine came away. No urine had passed for seventy hours. When admitted she was very prostrate, and was in agonising pain. Some months before, she had had a severe laceration at the right superior femoral region.

*Inspection*, made by Mr. Birkett on March 22nd.—In the right superior femoral region was a large cicatrix, of old standing. The nymphæ were oedematous. The thoracic viscera were normal. In the right iliac and pelvic regions was a large tumour, and behind the peritoneum was a quantity of extravasated blood. An enormous quantity of semifluid blood and coagula were found between the bladder and uterus and the rectum, with layers of old-standing lymph, having a concentric arrangement. About these organs, especially on the right side, the strong adhesions indicated old and continued morbid action. The coagula extended into a fossa passing out from the pelvis at the ischiatic notch, and the bony borders of this aperture were rather rough. In the inferior wall of the right external iliac, close to the distal commencement of the internal iliac, was the mouth of an old aneurism, and its sac had ruptured. The posterior wall of the vagina was sloughing and lacerated, the consequence, probably, of the pressure of effused

blood. The orifice of the vagina was partly closed by polypus, or rather hæmorrhoid-like growths. The uterus was normal, containing mucus; the ovaries were involved in adhesions. The right kidney was small and pale, and the pelvis and ureter dilated; the left pale, and not so much dilated as the right. The urinary bladder was penetrated below the meatus, and its posterior wall thinned by the pressure of the blood.

### CASE 13.—*Dissecting aneurism of the aorta.*

Mary S—, æt. 75, admitted November 23rd, 1860, in a dying state; she was in a febrile condition, and on the 26th a large pulsating tumour was felt in the abdomen, but there was good pulsation of the femorals.

The heart was small. The left ventricle was contracted and empty. The endocardium was thickened, and there were patches of atheroma on the valves. There was some fibroid degeneration of the muscular walls, especially seen in the muscular columns. The whole of the interior was streaked with fibre-tissue. On opening the abdomen a large tumour was seen in front of the lumbar vertebræ. The duodenum was closely adherent to its upper part, and below it was covered by the mesentery. On removing these parts blood oozed out, and on attempting to remove the tumour softened blood was found to surround it. On opening the aorta the tumour was seen to be a false aneurism around the vessel, or in part a dissecting aneurism. The interior of the vessel was covered with bony plates, and full of fissures; just above the bifurcation of the aorta a fissure an inch in length existed, and through this the blood had passed beneath and around the external coat, forming a large oval abdominal tumour beneath the peritoneum. A part of the effused blood was fibrinous; much of it had softened down into a pink, cream-like fluid, and with this the spine was bathed. On removing the surrounding parts the blood appeared to be circumscribed by the external coat.

This was a very rare instance of disease; the sex of the patient, the age, and the manner in which the blood was effused into the external coat, were all peculiar. The patient was very prostrate when admitted, and the febrile symptoms were those especially observed in addition to the pulsating abdominal tumour.

### CASE 14.—*Cancerous disease of the glands behind the stomach, simulating aneurism.*

John P—, æt. 52, was admitted under Dr. Addison's care, March 10th, 1862. He had been a sailor, and seven years previously he had suffered from dysentery in China. For twelve months he had worked at home as a rigger. His illness dated from nine months before admission, when he had severe pain at the scrobiculus cordis, accompanied with vertigo, pain in the shoulders. On the same evening vomiting came on, and recurred every night for several months. He never suffered from jaundice, but he had lost flesh considerably. He was a short man, of sallow,

cachectic appearance; his habits had been tolerably temperate. On admission he complained of weakness, of occasional vomiting, and pain; the vomiting was very irregular in its occurrence, sometimes ceasing for several days, and the patient stated that it did not occur when the bowels were open. No tumour could be felt, nor could any disease of the heart or lungs be detected to explain the symptoms. Perspiration readily took place. The urine contained purpures. He was ordered magnesia mixture, with conium and blue pill, three times a day. Belladonna, quinine, and an opiate at night, were afterwards given. On June 2nd a pulsating tumour could be felt at the scrobiculus cordis, to the left of the median line. The expansion was not equal. A prolonged bruit could be heard at the seat of the tumour, but none with the heart; there was tenderness at the scrobiculus cordis; the vomiting less severe; tongue clean; the feet swelled towards night; the pulse was small; he complained also of pain in the course of the sciatic nerve as far as the ankle. Emaciation increased, and he left the hospital in August unrelieved. Cancerous infiltration of the glands about the pancreas was found after death.

Although there was a cachectic state of the system in this case, and there was an absence of severe pain in the back, still the development of tumour at the scrobiculus cordis, with pulsation and with a bruit, closely simulated aneurismal disease. There was pain in the course of the sciatic nerve, and the vomiting was not from primary disease of the stomach. The tumour was not of a movable character, being in close contact with the pancreas; there was, however, a want of uniformity in the pulsation, which referred the disease to tumour pressing upon the aorta rather than communicating with it, and the whole character of the symptoms were those of cancerous disease.

**CASE 15.—*Cancerous disease at the pyloric extremity of the stomach; adhesions; pulsation; simulation of aneurism.***

George G—, æt. 56, was admitted into Guy's under my care, October 29th, 1862; by trade he was a bricklayer, and his health had failed for three months; pain had come on at the scrobiculus cordis, but he had neither suffered from pain in the back nor from hæmatemesia; the bowels had generally been confined; vomiting usually came on several hours after food had been taken. On admission he was emaciated and anæmic. In the abdomen a rounded tumour was found at the epigastric region, and to its right side; pulsation was well marked, but it was not regularly diffused, nor was there any general thrill, and no bruit could be heard. There was slight tenderness at the part. There was no evidence of disease of the lungs or heart. Under the use of bismuth and carbonate of soda in gr. x doses, with  $\text{m}\times$  of chloric ether, and with a *fluid* diet, he greatly improved; the vomiting ceased, and he gained flesh. Pulsation remained very distinct in the tumour. On December 6th severe pain came on in the left hypochondrium, and he became very ill and prostrate; opium



was given. On the 17th, the report states, that for several days he had suffered great pain in the side; there was no vomiting, but he was more anæmic, and the tumour was enlarged; the bowels were confined, and the pulse compressible and very feeble. To repeat the opium three times daily. On January 7th there was no improvement, and on the 14th the tumour was more diffused, but it still pulsated; there was no bruit in it. Vomiting took place occasionally after food, the pulse was compressible, the tongue clean, and the bowels were confined, but there was rather less pain and tenderness in the left hypochondrium. He was able to take milk, blanc-mange, wine, brandy, &c.; beef-tea produced sickness. Nutrient enemata were tried, but these he refused. The prostration gradually became extreme; and although the vomiting only took place occasionally, he slowly sank, and died on March 11th, 1863.

*On inspection*, the lungs were small and contracted; there was slight recent pneumonic consolidation (pyæmic); the heart was small. *Abdomen*.—Opposite the cartilage of the tenth rib, on opening the abdomen, a small abscess was opened; the parietes for the space of a crown-piece formed the wall of the abscess, and pus exuded. The duodenum adhered to the liver, and the transverse colon was also adherent at the same part. A small quantity of lymph was effused over the convex surface of the liver, but the general peritoneum was healthy. The intestines were contracted and atrophied; the pancreas was healthy. At the pylorus was a hard mass, and the growth pressed backward towards the pancreas, where it had come in contact with the large vessels. The stomach was not distended; the growth projected from the mucous membrane of the stomach at the pylorus, and extended about three inches into the stomach; the border was well defined; the surface was irregular, and in some parts sloughing; at the upper part the growth had nearly extended through at the site of the abscess, but extravasation had been prevented by adhesions. The muscular coat of the stomach was hypertrophied. The duodenum contained orange-coloured mucus. The growth in the stomach involved the mucous membrane, and near the pylorus the other coats; it was irregular in form, whitish in colour, vascular and medullary. On microscopical examination the tumour was found to consist of nuclei and cells, many of them of the form and size of columnar epithelium; in other parts of the growth degeneration was going on, and numerous fatty granules were observed. The kidneys were small, atrophied, and contained cysts. The liver was pale, and it was slightly encroached upon.

Although the pulsation in the epigastric tumour in this patient was very distinct, still there was no difficulty in the diagnosis; there was evidently pressure upon the pylorus, and the rounded but irregular growth was destitute of the thrill of an aneurismal tumour. The cachexia also was that of cancerous disease. It was evident, after death, that the manner in which the tumour pressed backwards to the aorta, at the same time that it was fixed by firm adhesions between the liver, colon, stomach, and duodenum, afforded ample reason for the pulsation. The improvement after admission was due to soothing remedial agents, combined with a fluid and nourishing diet.

**CASE 16.**—*Suppuration in the lesser omentum; the abscess localized, and undermining the coats of the stomach; pressure on the first portion of the duodenum, and symptoms of organic disease there; pulsating tumour.*

Mr. G—, æt. 53, an accountant, was seen by me in consultation; he had been accustomed to take freely of beer and wine, but, with the exception of slight indigestion for twelve months, he had enjoyed good health. His mother had died of cancerous disease of the uterus.

On November 12th, 1862, about 2 o'clock in the morning, he got out of bed, and drank freely of cold water; soon afterwards, about 3 o'clock, intense pain came on at the scrobiculus cordis and in the right hypochondrium, and vomiting shortly supervened. The pain and vomiting continued for several hours, but no sallowness of the skin nor jaundice, and no change in the urine nor alvine evacuations followed. Calomel and opium, with purgatives, were given, and leeches were applied. On November 15th there was return of the vomiting and of the pain, although less severely than at first. These symptoms lessened on the 16th, but had ceased on the following day, the 17th, and on the 22nd he seemed convalescent; but on the 24th pain was felt in the region of the transverse colon, and a hard, globular, and pulsating tumour could be felt between the scrobiculus cordis and the umbilicus. On the 25th, at 10 o'clock in the morning, he had severe pain and bilious vomiting, with constipation. Purgatives again afforded relief. And on December the 1st he complained only of weakness, but on the 18th the vomiting returned, and was relieved by bismuth and opium.

I saw him on December 22nd; a hale-looking man, with a cheerful expression, clear complexion, and without any cancerous cachexia; he did not suffer from pain after food, nor from nausea or vomiting; the bowels were regularly open, and the motions healthy, the urine clear and free from albumen; the appetite was good, and he was able to take freely of animal food; the tongue was clean. There was slight soreness at the epigastrium, and trifling pain in the back. Midway between the scrobiculus cordis and the umbilicus there was an ill-defined hardness, about three inches in breadth, deep, not fully resonant, and on pressure a gurgling sensation was produced; pulsation was felt at the tumour, either communicated to it or produced in it. There was resonance in the right and left hypochondriac regions to the ribs, and the other parts of the abdomen were supple, resonant, and free from either distension or pain on pressure. The mass felt above the umbilical region became less distinct when the patient sat up, and still less when he rested on his hands and knees, so also the pulsations; no bruit could be heard in the mass. The femoral arteries were normal, but there was slight enlargement of the glands in the groin. The action of the heart was good, and the sounds were healthy. The pulse was quiet, but compressible. There was no evidence of disease about the lungs, and the nervous system seemed strong and vigorous. He was ordered the tincture of quinine with chloric ether, and solution of acetate of morphia with camphor mixture, if the pain returned. Under this treatment for a short time, he seemed to gain strength, but he took more freely of animal food than was recommended, saying that he could not sleep unless he had rump-steak at midnight; but on January 27th

he lost his appetite, and nausea came on; till the 29th he slept well, on that day vomiting again commenced. On January 31st I found that the vomiting came on several hours after food had been taken, and generally in the evening. The ejected matters were frothy and fermenting; there was no pain, but flatulence; the tongue slightly furred; the bowels were constipated. The patient remarked strongly the absence of pain, both at the stomach and in the back. At the gastric region, and to the right of the median line, there was considerable prominence of the abdominal walls; there was more defined hardness, and partial resonance on percussion, but the pulsation was less distinct; no bruit could be heard, nor friction sound, but only gurgling. There was no enlargement of the abdominal veins, and no evidence of general peritoneal effusion. When on the hands and knees the pulsation in the tumour almost disappeared. He was ordered fluid diet; and if the vomiting persisted, nutrient injections, and ʒij of brandy. Bismuth, soda, and chloric ether, were tried internally, afterwards ice and opium; but a few drops of chloroform gave a greater amount of relief than any other medicine; still this relief was very transient. The vomiting was almost incessant, and extreme prostration rapidly supervened. On February 7th he was quite sensible, but cold and prostrate; the pulse intermittent and failing; the vomiting was constant, and he was evidently sinking. On the evening of the 8th, about 7 p.m., after a sudden attack of great pain, he said that he felt as "if something had given way," and after great suffering he died at 5 o'clock on the following morning.

*Inspection.*—On opening the abdomen the omentum appeared as a black, puckered mass. The stomach was enormously distended, and at its right extremity it was adherent to the gall-bladder and to the liver. The sac of the lesser omentum contained a well-defined abscess, with firm walls, which extended down to the pancreas, and near the latter was a considerable mass of black, sloughing cellular tissue. The boundaries of the cavity were very irregular; in front, by a smooth opening, it had extended to the stomach, and near the pylorus, had undermined its walls, so as to reach the mucous membrane, but the stomach was not perforated. The distension of the cavity had exerted considerable pressure on the front part of the duodenum. The pancreas itself was healthy, and its duct free, and there was no enlargement of the lymphatic gland; but at one part, towards the centre of the gland, several small ducts were distended, and communicated with the abscess. The abscess extended quite to the pancreas, and rested on the aorta and large vessels, celiac axis, and vena portæ. The liver was healthy, the gall-bladder was distended, and its duct was perfectly free into the duodenum. The mucous membrane of the stomach was entire, healthy, but there was partial gastric solution. At the first part of the duodenum, for one inch, the mucous membrane was gray, but not ulcerated. Other viscera were reported as healthy.

This case was, pathologically, of extreme interest and of great obscurity. It would seem that acute disease took place in the cellular tissue about the pancreas, leading to sloughing of the tissue; that the mischief was circumscribed; and that the distension of the cavity of the abscess exerted pressure on the adjoining parts—first on the aorta, so as to receive a pulsatory thrill, then on the duodenum and on the pylorus, so

as to cause obstruction and excessive vomiting. We regard the undermining of the coats of the stomach as an approach to perforation of that viscus, which would have afforded, at least, temporary relief.

The attack came on after drinking freely of cold water, and it may be asked whether that were sufficient to excite acute disease in the neighbourhood of the pancreas, as we find that from comparatively slight causes, disease of an acute kind sometimes takes place in the cellular tissue near to the parotid. We thought it possible that pancreatic or biliary calculus might have set up the disease, but of this we had no proof, for the ducts were perfectly free, and there was certainly no evidence of gall-stone having led to obstructed discharge of the bile.

The prognosis presented many difficulties, and several morbid conditions suggested themselves as explanatory of the symptoms; these were—gall-stone, cancerous disease or ulceration of the stomach or of the transverse colon, aneurism, disease of the pancreas or of the glands in its neighbourhood, local suppuration.

1. As to gall-stone. The sudden pain in the upper part of the abdomen, with violent vomiting, resembled the symptoms arising from impaction of a gall-stone; but the subsequent symptoms, as regards the absence of any jaundice or of change in the urine, or in the alvine evacuations, showed that the disease was not of that kind.

2. The absence of primary cancerous disease of the stomach was shown by the non-existence of cachexia, and by no increase of symptoms taking place after food; in fact, the patient had a large appetite, and partook of animal food largely without any pain.

3. The same remark applied to ulceration of the stomach. The entire absence of pain after food, of primary irritability of the stomach, of hæmorrhage from the viscus, of pain or marked tenderness at the scrobiculus cordis and in the back, showed that in this respect the mucous membrane of the stomach was free.

4. Disease of the transverse colon is sometimes remarkably local, and, as regards the position, the partial dulness, the gurgling, the sudden occurrence of pain, might simulate this

*Drawing of the Stomach and Abscess described in Case 16.*

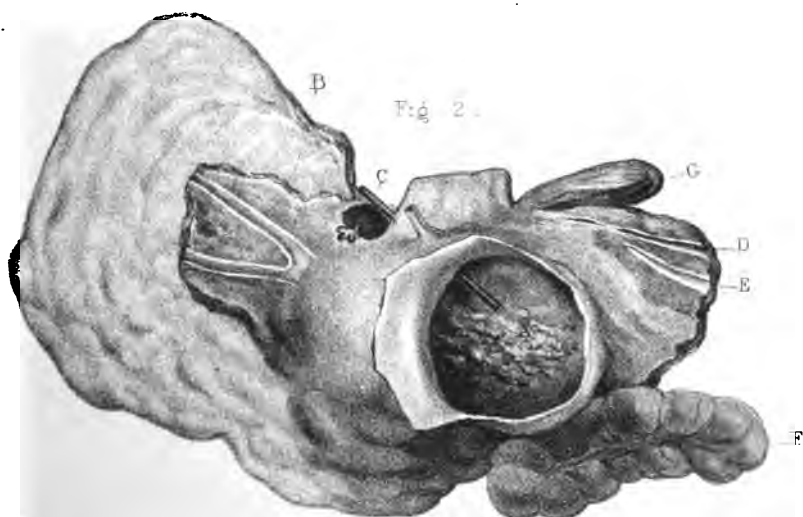
*Fig. 1* represents the anterior surface of the stomach, and it indicates the manner in which the abscess (*a*) pressed upon the pyloric extremity and undermined the mucous membrane (*b*). The abscess was situated behind the lesser curvature; and a part of the sloughing cellular tissue is shown.

*Fig. 2* represents the posterior aspect of the stomach; the abscess (*a*) is laid open, and its close contact with the pancreas (*b*) is shown; a small lobule (*c*) of the glandular structure of the pancreas communicates with the abscess. The pancreatic duct (*e*) and the bile duct (*d*) are free. The colon (*f*) is seen at the lower part. *g*. Gall bladder.

Fig 1.



Fig 2.





THE  
STEREOSCOPE,  
AND  
STEREOSCOPIC RESULTS.

---

By JOSEPH TOWNE.

---

SECTION III.<sup>1</sup>

CAN the stereoscope be accepted as an exponent of ordinary vision? or, Is the stereoscopic theory consistent with stereoscopic results? These were the queries raised in our last communication, and to their more complete solution it is proposed to devote the present section.

We have, in the course of our previous observations, alluded to some of the anomalies connected with stereoscopic vision; but there remains for investigation, a point more vital to the subject than any that has hitherto received our attention, and one involving considerations, compared with which, all others relating to stereoscopic vision must be regarded as subordinate. The fact to which we allude, is that the stereoscopic theory ignores the existence of any necessary physiological connection, between corresponding points of the two retinæ; and it will be found that the questions now before us involve this important consideration.

With reference to our first query, namely, Can the stereoscope be accepted as an exponent of ordinary vision? we may inquire into some of the circumstances connected with the construction and use of the stereoscope, note the conditions which are essential to the stereoscopic result, and subsequently compare stereoscopic vision with normal vision. And our second query, Is the stereoscopic theory consistent with stereoscopic

<sup>1</sup> Continued from the previous volume.



results? includes the question specially proposed as the subject for our present consideration, namely, whether or no there exists a necessary physiological connection between corresponding points of the two retinae. This question Professor Wheatstone, in perfect conformity with his theory, decides in the negative, and considers that he has proved the non-existence of such physiological connection.<sup>1</sup>

In demurring to this conclusion, we readily admit, or rather it is self-evident, that the two pictures prepared for the stereoscope, since they are not exactly similar, cannot fall on exactly corresponding parts of the retinae. It may be observed, however, that the centres of the two pictures fall upon corresponding parts of the retinae, and that it is only in the lateral directions, and towards the periphery, that there exists between the two perspectives any perceptible difference. The strongest evidence in support of Mr. Wheatstone's conclusions, would probably be found in the experiments which exhibit the blending of two unequal images; but these experiments have already been fully considered, and it has, perhaps, been made sufficiently evident, that the phenomena on which Professor Wheatstone bases his theory, may be traced to causes other than those to which he has ascribed them.

In pursuance of the course above suggested, we are to inquire into some of the circumstances connected with stereoscopic vision. Before we proceed to do so however, it may be well to offer a few preliminary observations relating to the co-operative, or reciprocal action of the two eyes, in normal vision—first with a view to observing the direction from which each retina respectively receives its impressions, and also the share which each eye respectively takes in the function to be discharged. The eyes are so placed with reference to the external field, that in normal vision, the two right sides of the retinae and the two left sides of the retinae are brought into reciprocal action; so, that in the absence of external impediment, these portions of the two retinae receive similar pictures; in short, the images which fall on the nasal side of the right eye, and those which fall on the temporal side of the left eye, are transmitted from identical objects in the external field, and *are therefore identical*. For example, if the right arm be extended on a plane even with the shoulder, the wrist being

<sup>1</sup> 'Philosophical Transactions of the Royal Society of London,' 1838, p. 385.

slightly bent inwards, the hand will be referred to the nasal side of the right eye, and to the temporal side of the left eye. If then, without withdrawing the right arm, the left be also extended in the same manner, the left hand will be referred to the nasal side of the left eye, and to the temporal side of the right eye. It follows therefore, not merely that the nasal side of one retina and the temporal side of the other retina receive identical pictures, but also that each eye receives an image from the opposite side of the external field, so that an image of the right hand is referred to the left eye, and an image of the left hand is referred to the right eye.

Trite as this observation doubtless is, we perceive in it the only secure ground on which to base our further investigations; and we may perhaps, without inconsistency, view with suspicion, any mechanism or theory connected with similar investigations, in which this first law of binocular vision is disregarded, ruling, as it does, not only the direction from which each retina receives its impressions, and the relation the two impressions have to each other, but also the share assigned to each portion of each retina, with reference to the external field. There are parts of the retinæ which do not reciprocate; to this fact we shall have occasion to recur, but it does not affect the question now before us, and need not disturb the course of our inquiries.

Our present observations, be it remarked, refer to the position of the images upon the retinæ, considered in their relation to objects in the external field; and we note, that the two eyes are not, so to speak, limited each respectively to the work of its own side, but that each eye participates in the work of the opposite side; we also note, that reciprocal or corresponding parts of the two retinæ receive their impressions from identical objects in the external field. These are striking and suggestive phenomena; it is observable however, that they refer simply to the direction from which the eyes receive their respective impressions; they do not, of necessity, imply the existence of any physiological connection, between those parts of the two retinæ, which in ordinary vision become similarly affected. And this is evident, since two cameras corresponding in form and size with the human eye, if placed in the same relation to external objects, would yield the same results.

We may now proceed, to inquire into some of the circum-

stances connected with stereoscopic vision; and a very slight examination of the stereoscope, will suffice to render it apparent, that between the conditions associated with ordinary vision, and those which are found to be essential to stereoscopic vision, there is a manifest difference; and however nearly the result obtained by means of the latter, may simulate that of the former, the idea remains, that beneath the artificial arrangements of the stereoscope, there may lurk some great discrepancy.

The first and most obvious necessity of binocular vision, would appear to consist, in a perfect co-operation between the two eyes; while on the contrary, stereoscopic vision, requires a complete separation, a perfect isolation of the eyes; so that, strictly speaking, the result of stereoscopic vision, should be regarded rather as a combination of two *monocular pictures*, than as the exhibition of one *true binocular picture*; and that this is not a distinction without a difference, is, we think, susceptible of demonstration.

The leading features of stereoscopic vision may be sketched in few words. If an object of three dimensions—length, breadth, and thickness—be viewed at a *near* distance, and with each eye alternately, it will be evident that dissimilar pictures are projected upon the two retinæ, so that the picture of the right eye will differ slightly from the picture of the left eye, and the difference between the two perspective projections, will be in exact accordance with the distance between the two eyes; this fact once recognised, the question arose, what would be the effect of simultaneously presenting to each eye respectively, instead of the real object, two perspective projections of the object, each respectively representing the perspective of the eye of the corresponding side, these projections being presented to the eyes, so that they may be referred to the same parts of the two retinæ, which would be affected were the object itself viewed.

Brief as our sketch is, it may serve to indicate the leading ideas connected with stereoscopic vision. And such were the thoughts, which germinating in the mind of Professor Wheatstone, found their material development in the construction of the stereoscope, the one essential condition of which, consists in a separation of the two eyes, so that the picture of the right side shall fall on the right eye alone, and the picture of the

left side shall fall on the left eye alone, a fact in itself sufficient, to suggest a more particular attention, to the conditions which are found to be essential to the stereoscopic result.

It is required that distinct pictures be simultaneously presented, at a near distance to the eyes, and previous to their intersection at the optic axes; that the pictures should not exceed in width the distance between the visual lines, and that the centre of each picture, shall be opposite the axis of the eye of the corresponding side. It follows, therefore, that one half of each picture must be placed to the inner side of the visual line, and the other half to the outer side of the visual line (Plate I, fig. 1). Such are the conditions essential to stereoscopic vision.

If now, we dispense with the stereoscope, and place before the eyes a single picture, representing similar objects to those represented in fig. 1, we shall observe the conditions of ordinary vision (Plate I, fig. 2).

But we may further illustrate the distinction between normal and stereoscopic vision, by adopting some definite form for the subject of our slides—for example, an animal, say a camel. In the first slide, we omit that half of each picture which, were the picture completed, would be placed within the visual lines,

Fig. 3.



and we retain that half of each picture, which is placed to the outer side of the visual line, as in the annexed drawing (Fig. 3). In the second slide, we omit that part of each picture which, were the picture completed, would be placed on the outer side

of the visual line, and we retain that half of each picture which is placed within the visual lines, as in the accompanying drawing (Fig. 4). In the former of these two experiments we observe the effect of omitting the inner half of each picture, and in the latter, the effect of omitting the outer half of each picture.

Fig. 4.



Viewed through the stereoscope, these slides both yield the same apparent result; that is, the visual images will, in both instances, represent a *perfect* camel; it will not, of course, be a stereoscopic picture, that is, there will be no superposition of the two images, but the result in both cases will be a *single* picture, representing the perfect animal; one half of the picture being *contributed*, so to speak, by each eye, in the first instance by the nasal halves of both retinae, and in the second instance by the temporal halves of both retinae.

There is, however, between these results an important distinction. In the first experiment, where those portions of the two pictures, which are placed to the outer side of the visual lines are retained, the two halves of the pictures are simply brought together, that of the right eye approaching from the right side, that of the left eye, approaching from the left side; hence the two portions meet in the centre, and appear reunited. A glance at Fig. 4 will render it obvious, that a simple bringing together of the two portions will not, in this instance, suffice to restore the symmetry of the animal; in the first slide (Fig. 3) the two halves are merely separated, while they retain their

true position in relation each to the other ; but in the second slide, the two halves are placed in reversed position, yet in both examples, the result is the same—a single picture of a complete camel. In the experiments next to follow it is proposed to use coloured objects, selecting and arranging our colours with reference to the facts intended to be elicited ; in the first experiment, harmonic colours are to be used, in the second disharmonic, and in both, the colours are to be so arranged that they shall fall upon corresponding parts of the two retinæ.

If a slide be prepared having two discs, one inch in diameter, leaving a space of about an inch and three quarters between their respective centres, the discs being divided by a vertical line into equal portions, and coloured, the outer half red, the inner half black, it follows, when seen in the stereoscope, that red will fall upon the nasal side of each retina and that black will fall upon the temporal side of each retina ; these portions of the two retinæ reciprocate, and red and black harmonise (see Plate II, No. 1). If a slide thus arranged be viewed in the adjustive stereoscope, the result will be a disc of one uniform colour, the colour being a mixture of red with black, and without the slightest unsteadiness or tendency to alternation. This result will be reversed, however, if a slide be used adopting precisely the same arrangement, only substituting for harmonic, disharmonic colours, namely, blue and yellow for red and black ; under these circumstances there will be alternation of the two images, with disturbance of the visual function, and the colours will not mingle (Plate II, No. 2).

These two experiments are intended to illustrate, the perfect sympathy, which we believe to exist between those portions of the retinæ, which in ordinary vision, are brought into reciprocal action. We have now to prove the absence of any *special* sympathy, between those parts of the retinæ which do not reciprocate. The figure we have selected for our observations is a disc ; in the previous experiments the disc has been divided vertically ; we retain the same figure, but we divide it horizontally, so that the upper part of the discs, shall be referred to the lower part of the retinæ, and the lower part of the discs to the upper part of the retinæ, these portions of the retinæ being *non-reciprocal*. If a slide be prepared having two discs similar to those previously described, the centre of each disc

being opposite the axis of the corresponding eye, with the upper half coloured blue, the lower half coloured yellow, when viewed in the stereoscope disharmonic colours, fall upon non-reciprocal parts of the two retinæ, the result being superposition of the two images, but without the slightest tendency to alternation or disturbance (see Plate II, No. 3). We may next prepare a slide with two semicircles, that is, with the inner half of each disc omitted, the distance between the two figures about an inch and three quarters, the figure on the one side to be coloured blue, the figure on the other side to be coloured yellow. Viewed in the stereoscope, the images fall, each respectively, upon the nasal half of the corresponding eye, so that in this experiment also *antagonistic* colours, are presented to *non-corresponding* parts of the two retinæ. Under these circumstances, the two images will come together and form a disc, the one half blue, the other half yellow, but without alternation or the slightest disturbance (Plate II, No. 4).

The position of the object viewed, with reference to the visual organs, must be of primary importance, in all questions relating to the phenomena of binocular vision. And such is the constant change, and interchange, of relative action between different parts of the two retinæ, that our information upon this point cannot be too precise.

We have already remarked, upon several points connected with stereoscopic vision; it will be well, however, before we proceed further with our inquiries, to observe somewhat more closely, not merely the phenomena on which Professor Wheatstone bases his theory, but we must also endeavour to ascertain, the *conditions* on which these phenomena depend. After having stated, that if an object of three dimensions be viewed so near to the eyes that the optic axes must converge, a different perspective projection will be seen by each eye, Professor Wheatstone thus proceeds:—"It being thus established that the mind perceives an object of three dimensions, by means of the two dissimilar pictures projected by it on the two retinæ, the following question occurs:—What would be the visual effect of simultaneously presenting to each eye, instead of the object itself, its projection on a plane surface as it appears to that eye? . . . . . Under the ordinary circumstances of

vision, the object is seen at the concurrence of the optic axes, and its images consequently are projected on similar parts of the two retinae; but it is also evident that two exactly similar objects may be made to fall on similar parts of the two retinae, if they are placed one in the direction of each optic axis, at equal distances before or beyond their intersection." This fact may be easily verified by placing any figure of three dimensions—an outline cube, for instance—at a moderate distance before the eyes, and, while the head is kept perfectly steady, viewed with each eye successively, while the other is closed.

We have in the above extract, the example selected by Mr. Wheatstone for the illustration of his first observation. A cube is to be placed about seven inches before the eyes; the head is to be kept perfectly steady, while the object is viewed first with one eye alone, then with the other eye alone; and it will be found that the image received upon the right eye differs from the image received upon the left eye; in short, that each eye respectively receives its own perspective.

If we examine the conditions here required, several ideas suggest themselves, on one or two of which we propose to offer a few remarks. The cube is to be held about seven inches before the eyes, and viewed first with one eye alone, and then with the other eye alone; but we would inquire, what will be the effect if, while retaining the cube in the same position, both eyes be opened at the same time? And be it here remarked that there are two conditions, under which the cube, as employed by Professor Wheatstone, can be seen when both eyes are open—the eyes may either converge upon the cube, or they may converge upon a point beyond the cube; the former condition will represent normal vision, *the latter will represent stereoscopic vision*; under the former condition *the cube will be too near the eyes to allow of distinct vision*, and under the latter *the cube will appear double*. It is observable, therefore, in this, the experiment on which the whole stereoscopic theory is founded, that it is required the object should be placed too near the eyes to admit of distinct vision, and that it be viewed first with one eye alone, and then with the other eye alone.

This experiment is brought forward to illustrate the phenomena of binocular vision, and we may remark, that if an object be viewed under the conditions required in this experiment,



the object will appear double, the result will be, a *visual fallacy*. Without, therefore, desiring to attach undue importance to these circumstances, we may hesitate in accepting this as a very perfect experiment; and it is, perhaps, difficult to escape the conclusion, that the illustration would have been more happy, had the conditions been less exceptional.

The problem involved in the stereoscopic theory of vision, may well be one of some difficulty, being nothing less, than how to explain singleness of result, from two distinct impressions, while at the same time "any necessary physiological connection" between the parts of the retinae affected is denied; nor is the subject free from difficulty, to those best informed, and this is observable even in connection with those points which must be regarded as essentially stereoscopic. Thus, for example, in alluding to the question, how or why dissimilar pictures projected upon the two retinae give rise to a single perception, Professor Wheatstone makes the following remarks:—"I will not attempt at present to give the complete solution of this question, which is far from being so easy as at a first glance it may appear to be, and is, indeed, one of great complexity. I shall in this place merely consider the most obvious explanations which might be offered, and show their insufficiency to explain the whole of the phenomena.

"It may be supposed, that we see but one point of a field of view distinctly at the same instant, the one namely, to which the optic axes are directed, while all other points are seen so indistinctly that the mind does not recognise them to be either single or double, and that the figure is appreciated by successively directing the point of convergence of the optic axes successively to a sufficient number of its points to enable us to judge accurately of its form.

"That there is a degree of indistinctness in those parts of the field of view to which the eyes are not immediately directed, and which increases with the distance from that point, cannot be doubted; and it is also true that the objects thus obscurely seen are frequently doubled. In ordinary vision, it may be said, this indistinctness and duplicity is not attended to, because the eyes shifting continually from point to point, every part of the object is successively rendered distinct; and the perception of the object is not the consequence of a single

glance, during which only a small part of it is seen distinctly, but is formed from a comparison of all the pictures successively seen while the eyes were changing from one point of the object to another."

This passage appears to us so doubtful in its construction, and exhibits so much of hesitation, that we are left uncertain whether, or to what extent, it expresses the views of the writer; and yet the phenomenon to which it refers is one essentially stereoscopic, and just that phenomenon, for a solution of which we should naturally turn to the author of the stereoscope. There is, however, some ambiguity, as well as hesitation, exhibited in this extract, for it would seem that duplicity of images, and comparative indistinctness of the peripheral portions of the retinal impression, are treated, to say the least, as though the two phenomena were very nearly allied, whereas, in truth, although they may *co-exist*, they are perfectly distinct. In the former we may observe an *apparent* imperfection in the visual organ, while in the latter we perceive a beautiful adaptation of the organ to its function. If, however, as maintained by Sir David Brewster, and hinted by Professor Wheatstone, but one point in the field can be seen single at the same time, so that our idea of the form of an object, is gained only by the convergence of the optic axes in rapid succession upon its different points, then is our idea of form, a memory; and not a visual impression, since, under these circumstances, it must result from a series of distinct impressions, which distinct impressions, it is required should be brought together by the mind, and embodied in one resultant perception; and further, if we admit thus much, it follows that during this process every point in the field, excepting the one point on which the eyes converge, must appear double, a conclusion, from which we think there is no escape, and one which surely implies imperfection in the organ of vision. If, however, we turn to the phenomenon of comparative indistinctness in the field, we perceive in this phenomenon a beautiful adaptation of the organ to its functions. In short, it is just this property of the retina, which gives perfection to the visual image, and invests it with its own peculiar charm, painting in clearer and brighter tints, that portion of the field to which the attention is immediately directed, and rendering in fainter

hues, those remoter points which, if more distinct, would be obtrusive.

It is, we think, this gradual fading off of the retinal picture, which peculiarly adapts it to our wants. Were every detail transmitted to the sensorium with equal brilliancy, the effect would be perplexing to the mind; all being equally bright, nothing would be distinct.

We must now revert to the several experiments, which have been introduced in the present section, that we may analyse them somewhat more closely. These experiments may be grouped under two heads—the one connected with direction, the other with colour; in the former we may observe identity of *action* between corresponding parts of the two retinae, and in the latter we may observe identity of *sensation*, in connection with corresponding parts of the two retinae.

A glance at figs. 1 and 2, Plate I, the former showing the conditions of stereoscopic vision, the latter those of normal vision, is, perhaps, sufficient to justify the inquiry, can the result under both conditions be the same? Still, if we take the lenticular stereoscope, and view in it a pair of binocular pictures, such as are provided for the instrument, we cannot fail to recognise a very striking result; and if it be granted that we detect anomalies connected with this result, which forbid its acceptance as a solution of the phenomena of normal vision, the fact still remains, that by means of the stereoscope, we obtain, not merely a very striking result, but also, that to some extent, we obtain a binocular effect. It becomes therefore, a point of some interest to ascertain, not merely what stereoscopic vision is not, but also to determine what stereoscopic vision really is; and to this end little, perhaps, would be gained by merely suggesting difficulties, or by exhibiting a series of doubtful and anomalous results; but if by further observation we are enabled to explain these anomalies, and reconcile these apparent contradictions, we shall then have gained one step, towards a solution of the difficulties by which our subject is surrounded. And in exact proportion to the soundness of our conclusions, with reference to the nature of stereoscopic vision, will be the tendency of the stereoscope, to lead or to mislead us in our search after truth; for whatever be our conclusions with reference to the stereoscopic theory of

binocular vision, of this we may rest assured, that given the conditions under which the stereoscopic result is obtained, it is consistent with those laws which regulate normal vision. Still, if by reflecting upon the provisions which are found to be essential to stereoscopic vision, we are induced to seek for something analogous to those provisions in connection with normal vision, we find it not; and thus are we led to inquire, why should the former be limited to these restrictive conditions, or why deranged if these conditions be disregarded? It is required, that the pictures prepared for stereoscopic vision should not exceed in width the distance between the visual lines, and the centre of each picture is to be exactly opposite the axis of the eye of the corresponding side. By this arrangement, it is secured that one half of each picture, shall be placed to the inner side of the visual line, and that the other half of each picture shall be placed to the outer side of the visual line; and be it further remarked, that the half of the picture placed to the outer side of the visual line, must fall upon the nasal side of the corresponding eye, while the half which is placed on the inner side of the visual line, must fall upon the temporal side of the corresponding eye.

If in connection with these facts it be considered, that the two pictures provided for the stereoscope, are so arranged that the inner side of the right picture, corresponds with the outer side of the left picture, we observe in the stereoscopic pictures, a provision which ensures that corresponding images shall fall upon corresponding parts of the two retinæ; but is there not in this arrangement of the stereoscopic pictures, an apparent concession to an existing necessity, and this, perhaps, somewhat to the prejudice of stereoscopic consistency? Still, in this one important respect, the conditions of stereoscopic vision coincide with those of normal vision; but if we observe this adaptation of the pictures to corresponding parts of the two retinæ, in connection with the enforced separation of the eyes, secured by means of the stereoscope, we perceive between the two provisions, a remarkable discrepancy. There is in the arrangement of the pictures, a provision for the reciprocal action of corresponding parts of the two retinæ, while by means of the stereoscope, the eyes are forced—so far, at least, as external appliances can force them—into distinct or separate action.

In the latter arrangement, we perceive that the reciprocal action between corresponding parts of the two retinae is ignored ; thus are we led to the point, where stereoscopic, and normal vision become divergent ; and if we refer to figs. 1 and 2, Plate I, we shall the more readily observe the cause of this divergence. It will be seen in fig. 1, and also in fig. 2, that corresponding images fall upon corresponding parts of the retinae ; for example, in both, figures A, B, C, fall upon the nasal side of the left retina, and also upon the temporal side of the right retina ; these portions of the two retinae correspond ; thus in both figures corresponding images, fall upon corresponding parts of the retinae. Where, then, lies the difference between the two forms of vision, as exhibited in these figures ?

We remark that in fig. 1, representing stereoscopic vision, the result is obtained, by adapting the pictures to the two halves of the retina, and this is effected, *by placing, or rather, as we think, by misplacing, one half of each picture within the visual lines*, that is, before the eyes, and previous to the intersection of the optic axes, although an object so placed will be seen double. This arrangement, therefore, of the stereoscopic pictures, would appear to be not only inconsistent with, but opposed to, an obvious law of binocular vision. The result is, that half the picture transmitted to each eye, is carried over to the other side to complete the picture of the opposite eye.

Having thus noted the conditions essential to the result obtained in stereoscopic vision, we may now refer to the conditions associated with normal vision, and it will be obvious, by inspecting fig. 2, that in the latter, the eyes converge upon a single point, 8 ; that there is no object placed between the eyes and the point on which they converge ; that the eyes receive their respective images from identical objects in the external field, and that identical images fall upon identical parts of the two retinae. Hence, since corresponding parts of the two retinae refer their images to the same spot in the external field, there is, under these circumstances, a perfect accordance between the visible direction of the retinal image and the *true position* of the object from which that image is transmitted. We here remark, that it is essential to the stereoscopic result, that one half of each picture shall be so placed with reference to the eyes, as to be incompatible with

the conditions of normal vision—which require, that the object be seen single, and in its true position.

Here, then, lies the discrepancy to which we have alluded—that, although by means of enforced and artificial arrangements, connected with the stereoscope, corresponding images are made to fall upon corresponding parts of the two retinae, yet, in consequence of the *false* position of portions of the pictures with reference to the eyes, the portions of the picture so placed, cannot be seen in their true position. We may further illustrate this point, by means of the material already before us, postponing, however, its fuller consideration until another opportunity.

If we turn to slides Figs. 3 and 4, pages 107, 108, exhibiting the figure of a camel, it will be seen that these slides have been so arranged, that the conjoint action of the two eyes is retained, while reciprocity of impression is avoided; that is, the eyes act together, but they do not reciprocate, because their respective impressions fall upon non-corresponding parts of the two retinae, the result being a single picture, the half of which belongs to each eye. In slide 3 those portions of the picture placed on the *outer* side of the visual lines are retained, while those portions, which were the picture completed, would be placed within the visual lines are omitted. In slide 4 those portions of the picture placed *within* the visual lines are retained, while those which would be placed outside the visual lines are omitted. Viewed in the stereoscope, the result in both instances is precisely the same, namely, a complete single picture of a camel. We may now observe, in both examples, the circumstances under which the symmetry of the animal is restored, and note how far these circumstances agree, with what for *convenience*, may be spoken of as the *retinal law* of visible direction.

In the first example, where the two portions retained are those placed outside the visual lines, each portion respectively falls upon the nasal half of the eye of the corresponding side, and the result consists in simply bringing together the two halves of the picture. In slide 4 the arrangement is reversed, those portions of the pictures placed *within* the visual lines being retained, while those which would be placed outside the visual lines are omitted. In this instance the portions retained fall upon the *temporal* sides of the two retinae, and in

perfect conformity with the retinal law of visible direction, which rules that the image shall be referred in a direction opposite to the part of the retina affected (do these two sides of the retinae, refer their images, each respectively, to the opposite side of the external field?); it follows, therefore, that so much of the picture as falls upon the temporal side of the right eye, forms the left side of the resultant picture, and that so much of the picture as falls upon the temporal side of the left eye, forms the right side of the resultant picture, involving, as it does, this remarkable anomaly, that the image received *exclusively* upon the right eye, goes to form the picture apparently seen by the left eye; and so forcible is the impression that the resultant picture, is *truly* that of the left eye, that it is only by closing one or other of the eyes, that the reality can be detected.

It is important to observe, in connection with these experiments, that they involve neither interference with the stereoscope, disturbance to the visual organs, nor any change in the relation of the objects viewed with reference to the eyes—literally speaking, it is a taking to pieces of the stereoscopic result; what we do is, to omit in each slide one half of each picture, leaving the remaining portions of the picture in their true position with reference to the eyes, and this with a view to observing the visible direction of distinct portions of the two pictures, as they fall upon distinct portions of the two retinae. In these experiments, therefore, we simply avail ourselves of the stereoscope, to illustrate the stereoscopic result, and thus we exhibit in detail those phenomena which must occur in every stereoscopic observation.

If now we recur to the several results which have passed under our review, it will be found they all connect themselves with *direction*. Our early observations had reference to the direction from which distinct parts of the retinae, receive their respective images, and it was shown that the temporal half of each retina receives its images from the opposite side of the external field, and that the nasal half of each retina receives its images from its own side of the external field, these phenomena being governed by the laws of optics. But other laws than those of optics, must be brought into action before the impression upon the retina can be transmitted to the sen-

sorium, since it is impossible this can be effected by any means external to the eyes.

There must, therefore, be two distinct forces in operation, one optical and external, which determines the position of the image upon the retina; a second, not external, and distinct from optics, which has reference to the transference of the retinal impression to the sensorium. And this is susceptible of illustration, by means of a very simple experiment; we refer to the phenomena resulting from pressure upon the eyeball. It is well known that pressure upon the eyeball occasions the appearance of a luminous spot, and that the spot appears in a direction opposite to the point of pressure. Thus, if pressure be made upon the upper part of the eye, a luminous spot will appear downwards, towards the cheek-bone; if upon the lower part of the eye, the spot will appear upwards, towards the brow. If pressure be made upon the nasal side of each eye, both spots will be referred outwards and laterally, that of the right eye to the right side of the field, that of the left eye to the left side of the field, the spot of each eye being, under these circumstances, referred to its own side of the external field. But if pressure be made upon the temporal side of each eye, the spot of the right eye will appear on the left side of the field, and the spot of the left eye will appear on the right side of the field. Thus do the results obtained by means of pressure upon the eyeball conduct us one step further in our inquiries, since they connect the point of the retina affected with the visible direction of the resultant image, and in the phenomena thus elicited, we recognise the existence of a force distinct from optics. By the laws of optics we have an image transmitted from a given spot in the external field, to a given spot upon the retina; by pressure upon the same spot of the retina, we have the resultant luminosity, referred in a direction towards the same spot in the external field. And this brings us to a point which claims our particular attention.

If pressure be made upon parts of the retina which correspond—say upon the nasal side of the right retina, and upon the temporal side of the left retina—two luminous spots will be seen; they will both appear on the right side of the field; and if the pressure be nicely applied, so that it shall affect exactly corresponding parts of the retinae, the two luminosities



will then appear to occupy the same place in the external field, so that the spot of the one eye will lie over the spot of the other eye ; and if this experiment be conducted in a room only partially darkened, with the left eye a little open, it will be obvious that the spot of the left eye, is not merely referred to the opposite side of the same eye, but that it lies to the *outer* side of the *opposite* temple. These results, form a series of consistent phenomena, and they lead us to the conclusion, that the temporal side of each retina, *belongs* to the *opposite* side of the external field, and that the nasal side of each retina, *belongs* to its *own* side of the external field ; with this additional fact, that while the two outer halves and the two inner halves of the retinæ *appear*, so to speak, to be acting at cross purposes, there exists between the outer half of one retina, and the inner half of the other retina, a most perfect identity of action, for not only do these portions of the retinæ receive their respective images from identical objects, but further, the images received upon these portions of the two retinæ, are referred to one spot in the external field.

This view is at variance with the stereoscopic theory, which ignores the existence of any necessary connection between corresponding parts of the two retinæ ; but we think the experiments which have already passed under our notice, are sufficiently illustrative with reference to this point. And we would here recall to mind, the three steps essential to the function of vision, and also that each step respectively is governed by distinct laws. The laws first brought into action have reference to the impression upon the retina ; those which are next called into exercise to the transmission of that impression to the sensorium ; and, finally, those which relate to the perception of the impression by the mind. It should be further observed, that as these forces are distinct in their natures, so also are they distinct in their operations, each respectively being limited to its own proper sphere of action.

We have been induced to pause a little at this stage of our inquiries, not merely from a belief that the results before us form an important step in these investigations, but also from a conviction that some obscurity has arisen, for want of discriminating between the distinct qualities, and separate action of these correlative forces ; and were any additional motive

required for giving to these considerations a certain prominence, we could point, to the remarkable reticence observed by those most interested in the stereoscope, with reference to all structures which lie behind the retina.

Having thus reviewed the experiments connected with direction, we may now turn our attention to those in which colour is introduced. The results obtained from the former would appear to be consistent with a perfect identity of *action* between corresponding parts of the two retinæ; and no means, we think, could be devised, that would tend more effectually to confirm, or to refute these results, than may be obtained through the agency of colour, nor any, perhaps, which could furnish a test more delicate in its application or more conclusive in its results. In the first experiment in which colour is introduced, the temporal halves of the two retinæ are submitted to black, while the nasal halves are submitted to red; it follows, therefore, since the temporal half of one retina corresponds with the nasal half of the other retina, that harmonic colours fall upon corresponding parts of the two retinæ; the result is a perfect mingling of the black with the red, and without the slightest disturbance of the visual function. In the next experiment, the two temporal halves of the retinæ are submitted to yellow, while the two nasal halves are submitted to blue; these colours being disharmonic, it follows that disharmonic colours fall on corresponding parts of the two retinæ, the result being that the colours antagonise, first one, then the other being seen, with now or then an iridescent appearance over the whole field, occasioned by the gleaming of one colour over the surface of the other colour. The disturbance occasioned by this means is sometimes very striking; the four halves of the retinæ appear to be thrown into separate action, so that their respective images are brought together, but not united; and for a second they appear as if struggling, so to speak, for their respective places. Under these circumstances, the changes which occur are remarkable; at one moment there will be a complete disc of yellow, the blue being altogether lost; at the next the yellow will entirely disappear over exactly one half of the disc, so that the resultant image is one half yellow, the other half blue, then the reverse, and so on, with constant alternations. In this experiment we

have disharmonic colours presented to corresponding parts of the retinae, the result being antagonism of the two impressions, great disturbance of the visual function, and that the colours do not mingle. It was essential, however, to the completeness of our investigations, that we should ascertain if the converse holds with reference to non-corresponding parts of the retinae, and the two concluding experiments have reference to this point.

In both, disharmonic colours are referred to non-identical parts of the retinae. In the first, the lower halves of the retinae are submitted to blue, while the upper halves of the retinae are submitted to yellow; and, finally, the nasal halves of the retinae are simultaneously submitted to the same antagonistic colours, and in both experiments without occasioning the slightest disturbance.

The two former of the above experiments are of a positive, the two latter of a negative, character; the former would seem to prove *identity of function* between *corresponding* parts of the two retinae, the latter a positive distinctness of action between *non-corresponding* parts of the two retinae; and this distinctness of action between non-corresponding parts of the retinae is observable from whatever point we take our view. They are distinct in that they receive their impressions from opposite sides of the external field. They are also distinct in that they refer their images in opposite directions. And, again, this distinctness of action between non-corresponding parts of the two retinae, is most remarkable in the phenomena exhibited in our last two experiments, showing that non-corresponding parts of the retinae, may be simultaneously submitted to antagonistic impressions without occasioning the slightest disturbance to the visual function.

Some care is required in preparing the slides for the above experiments; in those where colour is introduced, I have found it convenient to use glass as a medium for receiving the pictures, because it affords the best opportunity for securing an appropriate background, this being a very essential point in these experiments. For example, when blue and yellow are the colours used, a white background will be unsuitable, because yellow upon white loses much of its power, while, on the contrary, blue upon white acquires additional force by the contrast; if, therefore, a white background be used with these

colours, the result obtained will be materially modified, since by this arrangement the blue gains a preponderating power, and under these circumstances will, with some persons, completely obliterate the yellow, and thus the alternation of the images will, if not altogether prevented, be greatly modified. But if a background equally adapted to the yellow and to the blue be employed, the alternation of the images will be very marked. When the colours blue and yellow are used, vermillion affords a good background; when red and black, or red and green, are used, a white background is appropriate. The plan I have adopted in preparing these slides is, first to paint the figures upon the glass with a good body colour, and allow them to get perfectly dry, then to paint over them with a colour suitable for the background; by this means we gain a brilliancy of effect which cannot readily be obtained by any other method. The colours used in these experiments have been, for blue, ultramarine; for yellow, lemon chrome; for red, Chinese vermillion; for black, lamp-black. The adjustive stereoscope with the septum is to be used; the distance between the object-board and the eyes about eleven inches; and it may be added, that the drawings which illustrate this communication, have been made from the slides prepared for these experiments.

In arranging the slides 3 and 4, it is necessary the picture should be divided into exactly equal portions, that is, one half to each eye, so that the image of the right side, and the image of the left side, should cover precisely the same extent of surface; and also, that the two portions should be so placed with reference to the eyes, as to suit the vision of the observer. It is impossible to give exact rules on this point, because different individuals require slight modifications. The slides here figured are adapted to the ordinary lenticular stereoscope; they were used in the above experiments, and have been found suitable to the majority of those by whom they have been tried. The adjustment of the slide to the individual is, however, necessary in all stereoscopic observations, and it is observable, although the same slide may suit alike the young and the old, that there are in both classes, those for whom a special adjustment is required; this peculiarity does not, therefore, of necessity depend upon focus, but is probably connected with the form of the eye.

That the perfect identity of our results may be apparent, it remains that we should briefly revert to some of the experiments contained in the last section. Several of those experiments were introduced with a view to eliciting certain anomalies connected with stereoscopic vision, and in some of them the requirements of the stereoscope were not strictly adhered to, in so far as the arrangement of the objects, with reference to the visual lines, was not precisely followed. In the experiments now brought forward, the stereoscopic rules have been strictly observed, so far, at least, as regards the relation of the objects with reference to the eyes. The point in our present experiments, consists in *treating the several divisions of the retinæ in detail*, with a view to observing the visible direction of the retinal images, with reference to the parts of the retinæ affected. It is hoped, by these means, not merely to illustrate the subject more perfectly, but also to explain the apparent anomalies connected with our previous observations.

If, then, we turn to experiments Fig. 2 and Fig. 4, Section II,<sup>1</sup> it will be found that the former consists in adopting, instead of one continuous picture, a series of small distinct objects, these objects being ranged in the horizontal direction, and extending over a space of an inch and three quarters, the arrangement being the same for both eyes; the latter experiment (Fig. 4), in simultaneously presenting to the two eyes a series of different coloured spots, the spots for the one eye being red and those for the other eye being black, the inner spot of each group being placed opposite the axis of the corresponding eye.

In the first of these experiments minute portions of the retinæ are brought into separate or distinct action, and subject to these conditions it was observed, that objects placed opposite, or nearly opposite, the axes of the eyes, were superposed; those objects placed nearer to the centre of the slide, that is, *within the visual lines*, were referred in opposite directions—those of the right eye to the left side of the field, and those of the left eye to the right side of the field; while those spots ranged laterally, that is, to the *outer sides* of the *visual lines*, were seen single, and by the eye of the corresponding side. It will be obvious that the result obtained in this experiment, is perfectly analogous to those now brought forward. The spots

<sup>1</sup> 'Guy's Hospital Reports,' vol. viii, p. 85.

placed opposite the axes of the eyes are superposed, because they are referred to corresponding parts of the two retinae; those spots placed nearer to the centre of the slide, appear in opposite directions, because they fall upon the temporal sides of the retinae; and those spots which are ranged laterally are seen single, and by the eye of the corresponding side, because they fall upon the nasal sides of the retinae. Experiment Fig. 4 provides that one spot shall be presented to the axis of each eye, and to the *outer* side of each of these spots there are to be placed several other spots; be it remarked, however, that in this experiment there are to be no spots nearer to the centre of the slide than those which fall on the axes of the eyes; in other words, *there are to be no spots placed within the visual lines*. It results, that the two spots which fall upon the axes of the eyes are superposed, while those which are ranged laterally, that is, to the outer sides of the visual lines, are seen single, and by the eye of the corresponding side; these spots fall on the nasal sides of the two retinae, portions of the retinae which are *non-reciprocal*. Hence the colours of the central spots mingle, *because* they fall upon corresponding parts of the two retinae, while the colours of those spots grouped to the outer sides of the visual lines do not mingle, *because they fall upon non-corresponding parts of the retinae*. It appears, therefore, that our observations, as well those contained in former communications as those now brought forward, all converge to one point, and they seem to justify the conclusion, that the binocular effect known as stereoscopic, is not only perfectly consistent with, but that it results from, a *necessary physiological connection* existing between corresponding parts of the two retinae. And, further, that it is only by means of an exact adaptation of the stereoscopic pictures, to the *artificial* requirements of the stereoscope, that this effect can be obtained.

If, therefore, the stereoscope be regarded as an exponent of normal vision, we venture to think, that just in proportion to the accuracy of our tests, and to the force of our inquiries, will its claims in this respect, prove illusory and unsubstantial; and it is only, perhaps, when we associate with the stereoscope the facilities it affords for further inquiry, that we most justly appreciate, the benefit which science may derive from the labours of Professor Wheatstone, in connection with the physiology of binocular vision.

*Two Plates in illustration of Normal and of Stereoscopic Vision.*

PLATE I.

**Fig. 1** Shows the lines of direction upon the retinae from the two pictures viewed in the stereoscope.

„ **2** Shows the lines of direction upon the retinae from objects as viewed in normal vision.

PLATE II.

**Nos. 1 and 2** show the effect of different colours simultaneously referred to *corresponding parts* of the retinae.

„ **3 and 4**, of different colours simultaneously referred to *non-corresponding parts* of the retinae.

**No. 1.** Two discs, one half coloured red, the other half black, and so arranged that the different colours fall upon *corresponding parts* of the two retinae; *red and black harmonize, and the two co-mingle.*

„ **2.** Two discs coloured blue and yellow; the arrangement as in No. 1. These colours *do not harmonize*; the result is *antagonism* of the two impressions, and that the colours *do not mingle.*

„ **3.** Two discs coloured blue and yellow, the colours being so arranged that they fall on *non-corresponding parts* of the retinae; under these circumstances the two colours are distinctly seen, and without any disturbance of the visual function.

„ **4.** Two semi-discs, the one blue and the other yellow, being so placed that they fall each respectively on the nasal half of the retina of the corresponding side. When viewed in the stereoscope they form a disc, the one half yellow the other half blue; and the impression of the one side does not in any degree disturb the impression of the other side.

Fig 1.

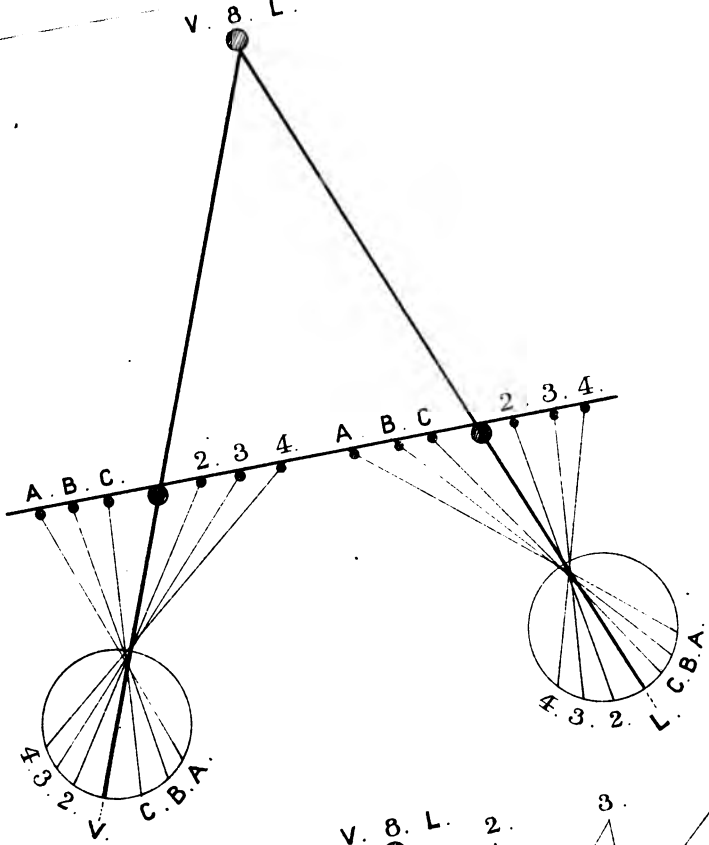
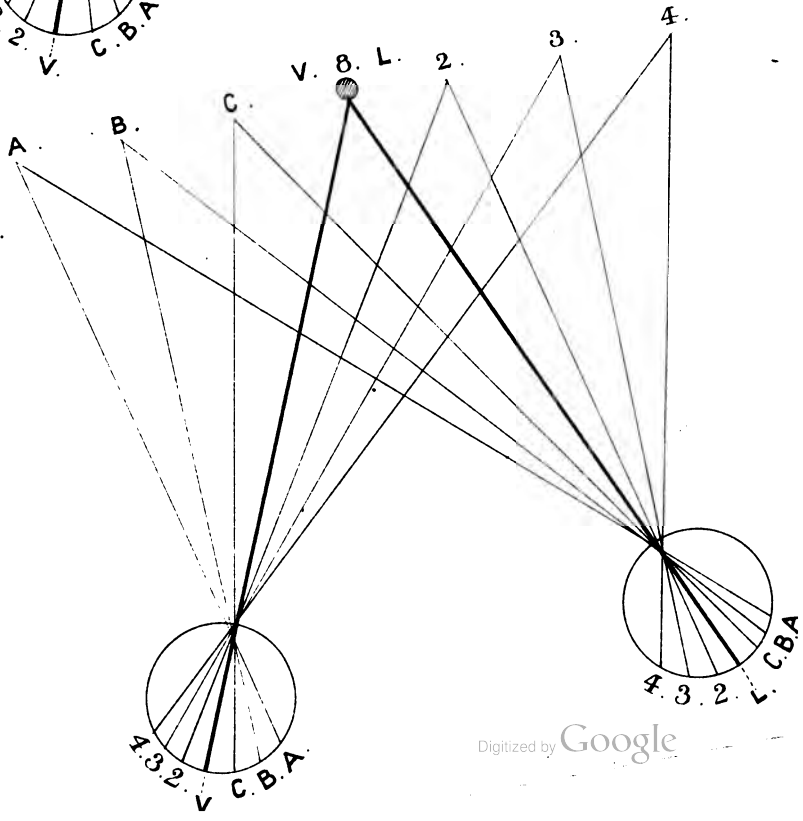


Fig 2.



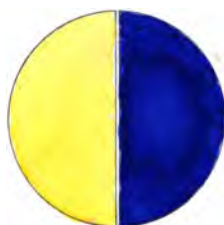




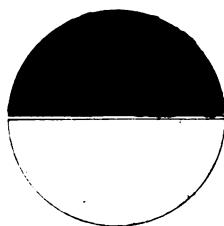
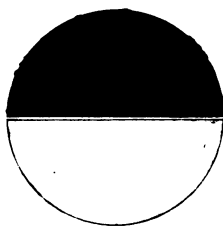
№ 1.



№ 2.



№ 3.



№ 4.





# THE STEREOSCOPIC TEST FOR THE RETINÆ.

---

By JOSEPH TOWNE.

---

## SECTION IV.

A GLANCE at the annals of ophthalmic surgery, will convey an idea of the benefit which science has derived from the introduction of the ophthalmoscope. And so perfectly does this valuable instrument fulfil its important purpose, that there would seem to be nothing to desire, so far as that purpose extends. But that there still exists a great necessity, for some means of testing the state of vision, with reference to conditions which leave no mark upon the retina, none practically acquainted with the subject will be disposed to question. It is with the hope of meeting this necessity, that an additional method of examination is about to be suggested. For those who have read our previous section, little further illustration will be required, since it will have been apparent, that with the assistance of the stereoscope, the several divisions of the retinæ can be treated in detail, and that the concurrent action of the two eyes can be retained, while reciprocity of impression is avoided.

By means of the ophthalmoscope we are enabled to look into the eye; with the aid of the stereoscope, we can discern precisely what each individual part of the eye can do. Through the agency of the former we may observe the visible signs of organic change; with the assistance of the latter, we are enabled to note with great precision, disturbances connected with the visual function, which, although more subtle in their nature, are not of necessity less fatal in their results. The affections

to which we allude, include those forms of blindness, or partial blindness, which are unconnected with any visible change upon the retinae; they are just those of which the patient can give no distinct account, and are indeed, frequently attended with phenomena so complicated, as to render it impossible the patient should unravel or decipher them. Hence there can be no doubt, that the results of paralysis, more or less complete, affecting the whole or portions of the retinae, furnish a wide and comparatively unexplored field, for interesting and important investigation; and these conditions, it would appear, are connected with phenomena, which so far as we know, have hitherto been veiled from observation.

It is, then, those phenomena that are beyond the reach of the ophthalmoscope that the stereoscope lays open to our view, and this, too, without submitting the patient to any painful examination, and by means so simple that they are within the reach of every intelligent observer. The great point in this method of examination consists, in separating the different parts of the retinae, and this is effected, by bringing into simultaneous action those portions which are non-reciprocal. Thus, by means of the first slide, we obtain a distinct view of the two *nasal* portions of the field, so that we have the images of the two nasal sides of the retinae, lying side by side, and by comparison we can detect the slightest difference between the two, down to a faint shadow or gray tint, which may frequently be observed upon the one side, while the other remains clear and bright; by means of the second slide, we obtain, precisely the same results, with reference to the *temporal* halves of the retinae; we may also observe that the portions of the retinae brought into simultaneous action, being non-reciprocal, the impression upon the one eye does not in the slightest degree affect the impression upon the other eye, impressions upon non-reciprocal portions of the two retinae, being, we believe, perfectly distinct. Hence we obtain, without disturbing the concurrent action of the eyes, an exact knowledge in detail, of the condition of every part of the retinae, so far as they are brought into exercise in the stereoscopic field, while, at the same time, we gain the additional advantage of comparing each portion respectively with its fellow.

It has been shown that non-reciprocal parts of the retinae

will, if the field be divided in accordance with these divisions of the retinæ, so far act in concert that the images referred to each side respectively, will meet in the centre, and form one *single* picture of the entire field; in short, that two slides may be prepared, omitting in the one slide the inner halves of the field, and omitting in the other slide the outer halves of the field, each of which, if viewed in the stereoscope, will represent the field in a single picture, this picture consisting of two distinct halves, and resulting from non-reciprocal halves of the two retinæ. It only remains therefore, that we point out the forms of the slides which will be found convenient for this method of examination; and that we illustrate their application by practical examples.

Seven different slides have been required in conducting these examinations, and they are of the simplest kind—the first, Plate I, fig. 1, includes the *nasal* halves of the two retinæ; the second, fig. 2, the *temporal* halves of the two retinæ; the third, fig. 3, the entire field for both eyes. Two other slides have been used to detect distortions of form, including scalloped and notched outlines; added to these, are two others, having exclusive reference to colour. We shall now proceed to describe these several slides, taking them in the order in which they have been named.

*Slide 1. Nasal.*—This slide consists of two semicircles, which being brought together, form a circle of two and three quarter inch diameter, the circumferential edges of these semicircles, being placed outwards, and the straight edges being placed exactly parallel, leaving a space of two inches between the two. This slide is formed in the following manner:—Having prepared a circle of the required dimensions, it is to be equally divided by two lines, the one horizontal, the other vertical, that is, into quadrants; each division may be again subdivided, making in all eight divisions of the field. There is also to be a small black spot in the centre, with three circular lines arranged at equal distances, from the centre to the margin. The use of these lines is twofold: first, they are intended so to divide the field that its several parts may be readily distinguished; but these lines are also convenient as a test of the state of vision. By some they can be seen, by others

they cannot be seen ; to some they appear steady, and can be counted, to others they appear wavy and uncertain ; and again, with some they are constant, with others they appear for a moment and then disappear. Figures or letters may also be introduced as occasion may require, for the purpose of detecting more exactly the condition of minute parts of the retinae ; *simplicity*, however, is a very important element in these arrangements. The circle thus prepared is to be divided into equal parts, that is, through the centre of the vertical line, so that one half of the vertical line shall be left on each half of the circle. The two semicircles are then to be gummed upon a piece of glass, the centres being on a plane and the cut edges exactly parallel with each other. (See Plate I, fig. 1.)

*Slide 2.*—The arrangements for slide 2 are precisely the same as those for slide 1, with the following exceptions: the circle is not to exceed two inches in diameter, and the two halves are to be placed in *reversed* positions; that is, the circumferential edges are to be turned inwards, leaving just sufficient space between the two to admit of their complete separation by means of the septum, when viewed in the stereoscope. (See Plate I, fig. 2.)

*Slide 3* consists of two circles, two inches in diameter, each circle being equally divided by two lines, the one vertical, the other horizontal, and the centre of each circle, when viewed in the stereoscope, is to be exactly opposite the axis of the corresponding eye. (See Plate I, fig. 3.)

*Slide 4* consists of two small circles, about three quarters of an inch in diameter, and placed three and a half inches distant from their centres. (See Plate I, fig. 4.)

*Slide 5* consists of 2 circles similar to those of slide 4, being placed, each respectively, about a quarter of an inch from the centre of the slide.

*Slides 6 and 7* are in outline and position, precisely similar to slides 1 and 2, but these slides being intended to test the retinae with reference to colour, it is required that the several divisions

be filled in with different colours,—red, blue, green, and yellow. These colours are to be so arranged, however, that no two agree for the respective sides. Thus, on the one side, blue, yellow, red, and green; on the other side, green, red, yellow, and blue.

Slides 1 and 2, serve, not merely to detect a complete or partial paralysis of those portions of the retinæ to which they are respectively referred, but they also show how far the great divisions of the retinæ coincide in their visible direction—that is, whether each division of one retina refers its image to its true position in the external field, in relation to the image of the corresponding division of the opposite retina.

Slide 3 enables us to observe how far the several divisions of the field coincide when the *entire* of both retinæ are brought into simultaneous action.

Slides 4 and 5 are connected with form, and have reference to distorted vision. Small figures have been selected for these slides, first, because I believe the results obtained from small figures to be most satisfactory, and also because small figures admit of being referred to distinct parts of the retinæ. This is an important consideration, since I have found that the retina may, under certain conditions, be so affected, that one division of the retina will give distorted vision, while another division of the retina will be free from a like disturbance; and again, one part of the retina may give one kind of distortion, while another part of the retina will give another kind of distortion. Hence the convenience of small figures, since they may with facility be referred to distinct portions of the retinæ.

Slides 6 and 7. The most satisfactory method for testing the retina with reference to colour, where the desire is to be very critical, would perhaps consist, in presenting one colour at a time, to the different divisions of the retinæ in succession; but, under ordinary circumstances, the slides prepared for the purpose may perhaps be considered sufficient. There is, however, undoubtedly an objection to presenting, at the same time, a number of colours arranged in parallel lines, such an arrangement being almost sure, if the vision be much impaired, to produce an amount of disturbance sufficient to render the observation of little or no value; but where the



colours are made to diverge from the centre to the margin, as in the slides proposed, I have not found this inconvenience to arise, and believe the arrangement to be satisfactory.

I prefer for these slides, glass as a base, with a vermilion background. A decided background is required to give a defined image; and my reason for preferring red to black, as a background for the slides, is that, under certain conditions of the retinae, we thus obtain a more exact idea of the state of vision. For example, the visual image is sometimes so thin that the background appears through it; and if under these circumstances the background be of black, and the field of white, the effect will be a gray tint over the field, and this may easily be mistaken for that shadowed appearance which results from other causes; while if the background of the slide be of vermilion, the red tint shining through the visual image, cannot be mistaken for the gray shadow so constantly attending impaired vision.

We may add a few words with reference to the instrument. There are many forms of the lenticular stereoscope now in use, and they are not all equally adapted to the present purpose. Some have the eye-tubes standing free from the top of the instrument, while others have the lenses on a plane nearly even with the top of the stereoscope; the form best adapted for our purpose is that in which the eye-tubes stand free above the instrument. Another point to be regarded, and it is most essential, is that there should be a septum to divide the two eyes; and it should be carefully observed that the septum is exactly in the centre of the instrument, that it is perfectly free from warp or twist, and that it dips far down, so that it approaches very near to the pictures: a thin plate of iron painted black, best suits the purpose.

To have illustrated the present communication with a series of cases, formed no part of the original intention, and doubtless, under ordinary circumstances, it would be little desirable that one unversed in such matters, should make the attempt; it soon became evident, however, that to determine exactly the course to pursue, or the results to be anticipated, without some opportunity of personally observing, the practical application of the means it was proposed to employ, would be im-

possible. Under these circumstances, the writer has been indebted to others for the means necessary for making these observations, and it will be understood, that the following notes make no pretension to rank with medical or surgical reports, but are to be regarded simply as memoranda, primarily introduced, for the purpose of developing the practical application of the stereoscopic test; while they may also serve as records of phenomena, some of which are highly interesting in a physiological, as well as in a pathological point of view.

Several of these cases have been obtained from the private patients of my friends; some from the general wards of Guy's hospital; and, through the kindness of Mr. Bader, some from the Eye Infirmary connected with the above institution.

CASE 1.—January 3rd, 1863. Mrs. R—, a charwoman and general helper, æt. 35, has been married ten years, and is the mother of four children. In person she is spare, her complexion sallow, her expression careworn and anxious; she looks ill-nourished, and has known much trouble and privation. This patient, when fourteen years of age, had an attack of scarlet fever, and on recovering from the fever suffered for some months severely with her eyes; subsequently her health has been generally good, until within the last year and a half, since which she has been subject to attacks like faintings. These attacks come on without any warning; the first sensation is that of giddiness, which is immediately succeeded by a loss of muscular power; the limbs give way, and she falls; there is an absence of pain, no struggling, and she never loses her consciousness. The condition she describes is one of extreme prostration; she can scarcely articulate, and feels “as though she were dying,” and sometimes remains where she falls without motion for an hour or two, after which her strength gradually returns; but she continues much enfeebled for several succeeding days. When recovering from these attacks there is a sensation of sickness, but without vomiting; this is always succeeded by a shivering fit, which lasts about half an hour, and these shivering fits are invariably followed by a severe headache, which usually continues for some days.

Her attacks are becoming more frequent, last longer, increase in severity every time they recur, and she has

observed that excessive fatigue brings them on. She now complains of sharp pain in the head and eyes; the pain appears to be inside the head, and at the back of the eyes, the left eye being always the most painful. These symptoms have been accompanied, during the last three or four months, with an occasional dulness of hearing, whether of one ear or of both the patient is unable to state. The dulness of hearing is not constant, nor is it obvious at this time.

Her vision is dim and uncertain—it fails most at night, and is best in the middle of the day; all objects appear as if enveloped in a mist; sometimes she cannot see a person six feet distant; at others she can just discern them, but very indistinctly; objects frequently appear distorted, a picture frame looks out of the square, the window frames look irregular, and do not appear to range with each other in the horizontal direction; “they look zigzag.”

She is rendered unfit for housework from constant mistakes, with reference both to distance and to direction; hence many accidents. For example, in attempting to grasp anything the hand is often thrust past the object, and not unfrequently comes into collision with it. A few days since, when attempting to fill a lamp, she was observed to be pouring the oil outside the lamp upon the table, and would have continued to do so had she not been prevented.

*Slide 1. Nasal.*—Sees the entire field, with the lines, and is able to count them. The image of the left eye is the higher, and has a gray shadow over it; the image of the right eye is clear and bright.

*Slide 2. Temporal.*—Sees both sides of the field, and is able to count the lines; but the two halves of the field will not come together. The image of the left eye is brighter than that of the right; over the image of the right eye there appears to be a gray shadow, and this darker image is the higher of the two.

We observe corresponding parts of the retinæ exhibiting corresponding conditions.

Left nasal, gray shadow over it—right temporal, gray shadow over it—right nasal clear and bright—left temporal brighter than that of the right.

*Slide 4. Small circles nasal.*—The image of the left eye is

higher than that of the right by three quarters of an inch, has a gray shadow over it, is scalloped nearly all round, and at times is scarcely visible. (See Plate II, Case 1, fig. 1.)

Image of right eye misty, outline irregular. (See Plate II, Case 1, fig. 2.)

*Slide 5. Small circles temporal.*—The image of the left eye appears egg-shaped and misty, with faint scallops on the right side; the line on the left side is gouty. (See Plate II, Case 1, fig. 4.)

Image of the right eye is scarcely perceptible; but when at intervals she discerns it for a few seconds, there are three deep *gaps* on the right side of the image; "they are not scallops, but gaps;" they are much deeper than scallops, and look as though "pieces had been notched out." (See Plate II, Case 1, fig. 3.)

February 10th.—*Slide 4. Small circles nasal.*—Image of the left eye darkly shadowed, with three scallops. This image is sometimes scarcely visible. (See Plate II, Case 1, fig. 5.)

Image of the right eye slightly misty, with two faintly marked scallops. (See Plate II, Case 1, fig. 6.)

*Slide 5. Small circles temporal.*—Image of the left eye egg-shaped and misty, with two notches at the lower part. (See Plate II, Case 1, fig. 8.)

Image of the right eye darkly shadowed; has three gaps, and occasionally is scarcely visible. (See Plate II, Case 1, fig. 7.)

We may here observe, not merely with reference to the shadowed appearance of the respective images, but also in connection with distorted form, that corresponding conditions prevail in corresponding parts of the retina. The left nasal darkly shadowed, with three scallops. The right temporal darkly shadowed, with three gaps, and the images, in both cases, occasionally disappearing. The right nasal slightly misty, with two faintly marked scallops. The left temporal egg-shaped and misty, with three faintly marked scallops.

A slide was next prepared, with two figures just as the patient described them; that for the right eye, with three "gaps" or notches; that for the left eye, egg-shaped and with scallops on the right side. The patient could see these drawings with steadiness, and count off the indentations without difficulty, which she could not always so readily do from her own distorted images. She stated that it assisted her very much when the "*scallops were made to the eye*;" that is,

she could discern the irregular images without difficulty, but she could not discern the regular figures without "some strain upon the eyes."

Very small circles, not larger than a pea, were next presented to the eyes, and it was found that distortions similar to those described, and quite as marked, were produced in these small figures; but on larger circles, say about one and a half inch in diameter, being used, the distortion was far less obvious. I have repeatedly watched the progress of these irregularities, and they appear to commence with unequal thickness of outline,—“gouty lines” they have been called by the patients. This unequal thickness of outline has increased, and formed distinct scallops; subsequently these scallops have assumed the appearance of deep gaps. I have also, as the patient has improved, watched the retrograde changes of these distortions back, through each successive form, to a slight thickening of parts of the outline, and all these appearances have uniformly subsided as the patient's condition has improved.

25th.—The left eye has been very misty during the past week. She has had pain at the back of this eye, but not any pain at the back of the right eye. She has at times been subject to this pain for several months past; it comes on occasionally and lasts for some days, then leaves her for a time. It is a sharp pain behind the eye, and shoots and throbs; headache always accompanies this pain at the back of the eye; but the patient describes them, that is, the pain behind the eyes, and the headache accompanying that pain, as being quite distinct.

*Slides 1 and 2.*—Condition little changed since the last examination.

*Slide 3. Field.*—Horizontal line widening towards left side.

*Slide 4. Nasal small circles.*—Image of right eye, two scallops on the left side, and nearly free from shadow.—Image of the left eye, three deep scallops, on the left side, and shadowed.

*Slide 5. Temporal small circles.*—Image of the right eye darkly shadowed, with four deep notches on the left side and towards the bottom.—Image of the left eye slightly shadowed, with two notches at the bottom.

It is to be observed here that the *left nasal* appears indented with three *deep* scallops, and that it is *darkly* shadowed; the *right temporal* with *four deep notches*, and that it also is *darkly shadowed*;—the right nasal with *two* scallops, and the image *comparatively bright*;—the left temporal with *two* gaps, and only slightly shadowed.

March 4th.—The patient states that she was threatened, on the day when I last saw her, with one of her attacks, but that she immediately retired to bed, and the attack did not come on. Headache ensued, and has continued up to this time. She has also had throbbing in the left eye, with shooting pains and occasionally flashes of light, the latter particularly when in the act of closing the eyes.

*Slide 1. Nasal.*—Sees the entire field. The left side looks “dirty,” and is a little higher than the right. Sees all the lines on both sides, but on the left they are dim.

*Slide 2. Temporal.*—Sees the entire field, but the side of the right eye very shadowy, and sometimes disappearing altogether, the left perfect. Left nasal dim. Right temporal very shadowy.

11th.—The headache complained of last week gradually subsided. Since that time she has been free from pain, and states that she now feels quite well.

*Slide 1. Nasal.*—Sees the entire field well, with lines and small letters on both sides perfectly. The left side is still a little “dirty,” but less so than on any former examination. The left side is also rather the higher of the two, but less so than it has been.

*Slide 2. Temporal.*—Sees both sides of the field quite well, with the exception that the image of the right eye is slightly tinged with gray. Image of left nasal “dirty.” Image of right temporal tinged with gray.

*Slide 3. Field.*—The widening of the horizontal line is less.

I note this widening of the horizontal line, because I have observed the thickening of this line to be the commencement of more marked disturbance, resulting in a complete separation of the upper and lower portions of the field. We here observe, that the widening of this line has become less as the other symptoms have been subsiding.

*Slide 4. Nasal small circles.*—The image of the left eye is

rather higher than that of the right, and continues slightly tinged; but the form is perfect, that is, quite free from scallops or notches, or any irregularity of outline.

The image of the right eye is clear and perfect, excepting that the outline of the circle on the left side is rather thicker than the rest of the circle.

*Slide 5. Temporal small circles.*—The image of the right eye has two notches on the left side, but they are much smaller than they have been. The image of the left eye is rather misty, but the form is perfect.

We observe, in the decline of these symptoms, the same comparative disturbance in corresponding parts of the two retinæ. The left nasal continues *slightly tinged*.—The right temporal has two notches.—The right nasal is *clear and perfect*, excepting a slight thickening of the line on one side.—The left temporal is *rather misty*, but the form is *perfect*.

25th.—*Slide 1. Nasal.*—Sees the entire field, with the lines and small letters, *perfectly* well, and the two halves coincide. Until now, the left half has been the higher of the two. The only difference between the two sides of the field now observable is, that the left side continues a little misty.

*Slide 2. Temporal.*—Sees the entire field, with the lines and small letters, very well. The image of the right eye rather misty, the two sides coincide.—*Left nasal a little misty—right temporal rather misty.*

*Field.*—The widening of the transverse line has nearly disappeared.

April 2nd.—The only remaining indication of past disturbance appears in a slight tint, or “dirty look,” over the image of the left nasal. Form, in each division of the two retinæ, taken separately, is now perfect, and the widening of the transverse line, forming the horizontal division of the field, slide 3, has entirely disappeared. The patient considers herself perfectly well; she has had no return of her faintings; her appetite is good; she sleeps well, and feels quite equal to her duties. Her appearance, in every respect, is greatly improved. (See Plate II, Case 1, where the various distorted figures are shown.)

CASE 2.—March 21st.—Mrs. R—, æt. 55, a very delicate-

looking person, suffering, as she herself states, from a "weak heart." She has for two years past been a widow; was thirty-six years married, and had a large family; her circumstances were easy until the death of her husband, since which she has been discharging the duties of a monthly nurse. Early in life, and previous to her marriage, she was subject to dimness of vision, with headache, and occasionally she could see but one half of an object, the upper half being the portion lost; this inconvenience ceased after her marriage, and she had no other trouble with her eyes until about a month since, when, on first rising in the morning, her attention was directed to an imperfection in her vision, by observing that she could not "see out of the corner of her left eye," and her field of vision is daily becoming more limited; she does not suffer from pain either in the eyes or the head.

*Slide 1. Nasal.*—Sees the image of the right eye, excepting a small portion of the upper part. Of the image of the left eye nothing is seen excepting a small portion of the lower part; the parts of the field which she sees, are quite distinct, and appear as "if cut out with a pair of scissors, and laid upon a dark background." On the image of the right eye she can see the lines distinctly, and count them. (See Plate II, fig. 1, Case 2.) It is to be observed that those portions of the images which are seen appear in their true position.

*Slide 2. Temporal.*—Of the image of the left eye, sees all but a small portion of the upper part.

Of the image of the right eye, sees only a small portion of the lower part; the lines are distinctly seen.—Left nasal nearly lost.—Right temporal nearly lost.

It is to be observed that the result obtained from the two nasal halves of the retinæ, and that obtained from the two temporal halves of the retinæ, are almost identical.

25th.—The condition of the eyes very much the same as on the 21st, excepting that the image of the nasal side of the right eye is slanting from the perpendicular, and at the lower part overlaps the small portion of the image of the left eye. (See Plate II, fig. 2, Case 2.)

April 9th.—*Slide 1. Nasal.*—The upper half of the image of the right eye is now lost, a small portion of the lower part



of the image of the left eye is seen, but does not appear on a plane even with the corresponding part of the image of the right eye; she can discern with clearness the lines over those parts of the field that are visible. (See Plate II, fig. 3, Case 2.)

*Slide 2. Temporal.*—Of the image of the left eye, nearly one half is lost, and she cannot see the lines upon the remaining portion. Of the image of the right eye, she can discern a portion at the lower part of the field, somewhat larger than at the last examination, and the portions of the two sides of the field stand in their true position with respect to each other.

April 22nd.—*Slide 1. Nasal.*—Of the image of the right eye she loses a portion from the upper part, but not so much as when last examined. Of the image of the left eye she has regained a considerable portion.

*Slide 2. Temporal.*—A marked difference has occurred in the temporal halves of the retinæ since the last examination. Of the image of the left eye there is now but a small portion lost, while the image of the right eye is considerably extending upwards, and the two sides are in their true position.

This patient is evidently improving; it was observed at the last examination that those portions of the field which could then be discerned, had regained their true position; this change I believe to indicate amendment. We now find that the field of vision is extending on the nasal, but more particularly on the temporal sides of the two retinæ.

29th.—*Slide 1. Nasal.*—She has regained almost the entire field of the right eye—the upper point only is now lost. Of the image of the left eye, a small narrow portion at the upper part is lost; she sees the lines and figures over those portions of the field that are visible, both sides appear a little misty.

*Slide 2. Temporal.*—The result almost the same as that obtained from the nasal halves of the retina; a little more is lost from the image of the right eye.

May 5th.—*Slides 1 and 2.*—Both images are clear and bright, and they perfectly coincide; that of the right eye is almost perfect, of the image of the left eye a very little is still lost of the upper and outer margin. (Plate II, fig. 4, Case 2.) The patient considers herself well, and is returning to her

duties. Plate II, Case 2, shows four figures representing the distorted images as above described.

CASE 3.—March 5th, 1863.—Mrs. T—, a married woman, æt. 49, has two children, her occupation merely domestic; she has never enjoyed strong health, but has not until of late been much troubled with her eyes.

Two years since had an attack of giddiness, and saw things double; this lasted about a fortnight, after which the inconvenience ceased, and her vision has remained good until a month since, when she was again “taken with seeing things double,” but without any return of giddiness or pain in the eyes. At this time she does not see things double, but complains of having a thick mist before her eyes; this thickness before her eyes not being worse at one time than at others, but constant, so that all objects appear as under a cloud and indistinct; she has long been deaf on the right side.

*Slide 1. Nasal.*—Sees the entire field, but the two halves do not coincide; the image of the left eye is the higher by about three quarters of an inch, and the two half circles diverge towards the top, while they slightly overlap at the bottom; the right is the brighter side of the two, the left looks “thick;” the lines are perceptible on both sides, but they are least distinct on the left side. (See Plate II, fig. 1, Case 3.)

*Slide 2. Temporal.*—Sees the entire field; the lines are perceptible on both sides; the two halves slope from each other at the top, but meet towards the bottom; the width between the two semicircles at the top is about a quarter of an inch; the image of the left eye is the higher of the two by nearly half an inch, and also more dull. (See Plate II, fig. 2, Case 3.)

March 26th.—*Slides 1 and 2.*—No change has occurred requiring notice.

The day before yesterday the vision of this patient was clearer and better than for some weeks past, particularly that of the right eye. Yesterday she again saw things double—one image above the other, with a difference between the double images of nearly a finger’s length. When she first woke in the morning things looked “askew,” and one higher than the other. All objects appear right in colour, but “thicker” with the left eye than with the right.

*Slide 3.—Field.* I have on several previous occasions noticed, that the horizontal line dividing the field was undergoing change; this line first appeared thickened towards the left side, and continued to expand fan-like from the centre outwards; subsequently it opened on the left side, and formed two lines which converged towards the centre; this opening has gradually become wider, and now extends beyond the centre; the upper half of the field of one eye is proportionately raised above the corresponding half of the field of the other eye. (See Plate II, fig. 3, Case 3.) *Simultaneously with this condition, the patient has double vision.*

When she uses glasses, she is obliged to cover one eye; the cause is, that without her glasses she can scarcely discern objects, and therefore is not conscious of double vision; but when, by means of her glasses objects are rendered distinct, she finds the necessity for closing one eye to avoid the confusion arising from duplicity of images.

April 17th.—*Slide 1. Nasal.*—Sees the entire field, with the lines distinctly; the image of the right eye is clear, that of the *left eye is thick,—the two sides now come well together.*

*Slide 2. Temporal.*—Sees the entire field, with lines and figures; the image of the right eye is “thick,” the image of the left eye is clear.

*Slide 3. Field.*—Sees the entire field; *the lines both vertical and horizontal now coincide*, but the horizontal line still thickens towards the left side, and there is still a narrow shade of blue over the upper part of the field on the left side, and extending downwards lower than the horizontal line. She no longer sees double, and with the assistance of glasses can now read with comfort, while using both eyes at the same time.

It has not been thought necessary to give every examination of this case in detail; but it should be remarked, that the first examination did not exhibit corresponding conditions in corresponding parts of the retinae. On that occasion the image of the *left nasal* was shadowed, while that of the *right temporal* was free from shadow; but subsequently the case assumed a different character; that is, exhibited corresponding conditions in corresponding parts of the retinae—this is apparent in our last report.

Right nasal, clear.—Left temporal, clear.  
Left nasal, thick.—Right temporal, thick.

CASE 4. — January 31st. — Mr. ——. This gentleman, whose health does not appear strong, is recently from one of the public schools, and has of late been reading, probably too hard, in preparation for one of the universities. The first indication he observed of impaired vision, was the appearance of a black spot before the left eye. At first the appearance of the spot was only occasional, but subsequently it was almost constant, and became very troublesome; he then began to experience indistinctness of vision, which for some time past has been increasing, and of late he has been troubled with double vision; the images appear one above, or higher than the other; the lower image is bright and clear, the upper is less distant, and looks somewhat like the shadow of the more perfect image. His condition improved considerably under treatment for about a fortnight, since which, including a period of two months, it has remained almost stationary. He is free from pain, excepting when using his eyes somewhat more than usual; under these circumstances he suffers pain at the back of the eyes, and in the head.

*Slide 1. Nasal.*—The two halves of the field do not coincide; the image of the left eye is the higher, and at the upper part overlaps that of the right eye. The image of the right eye is bright and clear, the lines are perfectly well seen, and they are steady, so that they can be counted.—The image of the left eye is misty, and the red of the background appears through the retinal image; on this, the left side, the patient cannot see the lines constantly, but sees them for a moment, and then they disappear; the lower third of the image is darkly shadowed and is occasionally lost. (See Plate III, fig. 1, Case 4.)

*Slide 2. Temporal.*—The image of the left eye is perfect, the image of the right eye is shadowed, most so over the lower third. The image of the left eye is higher than that of the right, the two halves are divergent, with half an inch of space between them, this space being wider at the top than at the bottom. (See Plate III, fig. 2, Case 4.)

The left nasal is misty, and the lower third of the image is darkly shadowed, and occasionally disappears.—The right temporal is shadowed, deeply so, over the lower third.—The right nasal is bright and clear, and the lines can be well counted.—The left temporal is perfect.

We may observe here that while *corresponding parts* of the *retina exhibit corresponding* conditions, that the nasal side of the left retina is evidently the most feeble. This is shown, not merely in the occasional disappearance, but also in the thinness of the image of this side, apparent in the fact that the red background appears through the image.

April 29th.—This gentleman, since last I saw him, has been cruising in the Mediterranean; there is more tone in his general appearance, and his health has decidedly improved; during his absence the sight of the left eye was for some days very nearly lost; he could but just distinguish an object when held very near to him, with every advantage of light, and then he could only distinguish it as a shadow. The sight became thus impaired rather suddenly; it appeared to go in one night, without any assignable cause; he has occasional pain over the eyes, is still troubled with double vision, and this has rather increased.

*Slides 1 and 2.*—But little change has occurred since last examination. It is observable, however, that the different divisions of the field coincide somewhat more perfectly, particularly the nasal slides.

*Form.*—Forms distorted. (See square and round, Plate III, figs. 4 and 5, Case 4.)

*Field.*—There is an apparent division of the field at the horizontal line; the two lower halves of the field coincide, while the upper half of the field of one eye is referred to a point higher than the corresponding half of the field of the other eye. There is a separation of these portions of the field exactly at the horizontal line; and the effect is described by the patient as that of a dark shadow over the upper part of the field, commencing at the horizontal line on the right side, and extending to the horizontal line on the left side. (See Plate III, fig. 3, Case 4.) It has already been stated that this patient *has double vision*.

CASE 5.—G. M.—, æt. 50, by occupation a bricklayer, was admitted into Guy's Hospital last December for concussion of the brain, where he remained about three months. He suffers from weakness in his limbs, and has been unable to work ever since his accident. Being prevented from light work, through an imperfection in his sight, there is a cloud constantly before his eyes, and "it seems to hang over his eyes so that he cannot get a clear sight of anything."

*Slide 1. Nasal.*—Sees the images of both eyes; both are dull, but the image of the *right* eye is *very dull*; he can scarcely discern the lines on either side, and with much uncertainty; they are unsteady and they are occasionally quite lost, particularly on the *right* side. (See Plate III, fig. 1, Case 5.)

*Slide 2. Temporal.*—Sees one semicircle, the image of the *right* eye fairly; he can just discern something like a shadow of another semicircle, the faint image of the *left* eye. Right nasal, very dull; left temporal, faint shadow of an image. (Plate III, fig. 2, Case 5.)

*Field. Slide 3.*—The upper half of the field of one eye is much raised, and appears upwards and outwards, leaving a dark shadow on the upper and left side of the field, precisely as described in the last two cases. This patient has, in reality, double vision, although he is not conscious of double images, and this because his vision is too feeble to give distinctness to the objects; he, therefore, perceives only a dark stationary shadow hanging over his eyes, and is prevented from seeing anything distinctly.

April 27th.—The condition of this patient is greatly improved; he states that he is better in health, that he has lost the cloud from over his eyes, and that he sees much better.

*Slide 1.*—Sees both sides very fairly, and can count the lines upon them; the image of the *right* eye is shady.

*Slide 2.*—Sees both sides well; the image of the *left* eye is shady, but not so much so as that of the nasal side of the *right* eye. The form of the entire field, that is, the combination of the images of both eyes, appears oval, and it is remarkable in this patient that if a round be presented to the *nasal* sides of the retinæ the form is correctly seen; but if a round be presented to the *temporal* sides of the retinæ it appears as an oval.

CASE 6.—December 30th.—J. F—, a nervous, feeble man, æt. 26 ; his occupation assistant-bailiff ; now under treatment for cerebral affection. This patient has constant twitching of the features, particularly of the eyes, which are occasionally so powerfully affected as for the time entirely to preclude their use : his gait is tottering and uncertain, and he is sometimes troubled with giddiness, so that he cannot walk straight ; things appear to “dance about before him, and seem all confused ;” he usually sleeps pretty well, but talks much in his sleep, and dreams a good deal ; he often wakes frightened, has repeatedly left his bed during sleep, and on one occasion was attempting to escape through the window.

He is quite at fault when he attempts to direct his hand to any given point ; he can see the features of a person at a yard distance, but not distinctly, or so that he could recognise them again, and the colour of the skin appears “tawny brown.” He can distinguish colours perfectly if they be presented to him one at a time ; but if two or more colours are presented at the same time he becomes confused.

He had never suffered pain or inconvenience from his eyes, or suspected anything wrong in his vision, until about six years since, when, on putting a gun to his shoulder for the purpose of shooting a rabbit, he found that he could not see up the barrel of the gun, or with the right eye distinguish any object clearly. On the previous day there was not anything the matter with the eye ; of this he is certain, because on the previous day he had been shooting, and without difficulty had killed several birds ; his vision on the left side continued good for a week subsequently, when the left eye also began to be affected, and from this time both eyes have continued faulty.

*Slide 1. Nasal.*—Sees the image of the left eye fairly, but the lines dazzle. He just discerns the inner part, and near to the centre of the image of the right eye, but the two images do not “stand true ;” they seem to slope off one from the other. He quite loses the peripheral part of the image of the right eye, but there is no clearly defined line where the image is lost ; it gradually fades off, and is lost in shadow, sometimes disappearing altogether.

*Slide 2. Temporal.*—Sees the entire field, but the two sides

are not the same ; the image of the right eye looks bright and clear, the image of the left eye is indistinct and dark.

*Form.*—Considerably distorted ; portions of the images are also lost.

This patient describes himself as being, or as having been, blind with the right eye, and states that he lost this eye in the first attack ; but we observe that there is no evidence to justify this conclusion. On putting the gun to his right shoulder, and finding that he could not see up the barrel, he believed himself to be blind on that side ; and most patients who have lost the nasal side of one eye will describe themselves as being blind, or nearly so, on the corresponding side.

This patient appears to attach little or no value to his right eye, and frequently speaks of himself as being blind on that side. He is doubtless quite right in attaching most value to his left eye, because the nasal half of this eye affords him the most *useful* vision ; yet the vision he obtains from the *nasal half of the left eye* is not nearly so perfect as that he obtains from the *temporal side* of the *right eye*—a fact of which the patient is wholly unconscious ; and I doubt not that he attributes to the left eye much of the advantage he gains from the bright portion of the opposite retina.

February 16th.—His appearance is in every respect less favorable than when last I saw him—more excitable, more nervous twitching, more feeble, and more uncertain in his gait, He states that he has had bad fits, which have left him “not like himself,” and that his vision has become very dim and thick.

*Slide 1. Nasal.*—For a short time he could discern the entire image of the right eye, and could even see the lines upon it ; but soon the outer third of the image became very shadowy, so that it was with difficulty he could make it out. Of the image of the *left eye* *nothing whatever could be discerned.*

*Slide 2. Temporal.*—Sees the images of both eyes, but they do not come together by two inches, and they slope away from each other, the width between the two increasing towards the top ; they are both shadowy, but the image of the left eye is the clearer of the two.

On inquiry in the ward, the sister informs me that this



patient had been getting on very nicely, and was soon to have left the hospital, when, about a fortnight since, soon after retiring to bed, he was seized with a very severe epileptic fit, which continued for nearly half an hour, and "she thought he would not have come out of it;" in a few minutes this fit was succeeded by a second almost as severe; he had three others during the night. Since the fits he sees flashes of light whenever he moves the eyes.

We may here observe, and it is the point in this case, that since the fits the condition of the retinæ is reversed. At our first examination it was the right nasal and the left temporal divisions of the retinæ that were most impaired; it is now the left nasal and the right temporal divisions that are most impaired. We further note that while this change has in one respect exactly reversed the condition of the patient, in another important respect his condition remains unchanged; in the first examination it was corresponding parts of the two retinæ most affected; and so, too, in the second examination it is corresponding parts of the retinæ most affected; but *since the fits* the disturbance has *passed over to the opposite sides*.

Observing the condition of the retinæ at both examinations, and noting on each occasion respectively the portions of the retinæ most affected, they appear as follows:—

December 30th.—*Slide 1. Nasal*.—Of the image of the *right* eye but a small portion could be seen, and this portion sometimes disappeared.

*Slide 2. Temporal*.—The image of the *left* eye was indistinct and dark.

February 16th.—*Slide 1. Nasal*.—Of the image of the *left* eye nothing could be seen.

*Slide 2. Temporal*.—The image of the *right* eye was least distinct.

CASE 7.—November, 1862.—Miss —, æt. 22, by no means a robust or strong-looking person; still her health has been equal and tolerably good, she never having experienced serious illness, with the exception of the attacks about to be referred to.

This patient suffered from severe fits in cutting her first teeth, and it was thought that she would never complete the

process of infantile dentition. When about fifteen years of age she became subject for many weeks to constant sickness, accompanied with severe headache and inability to pursue her studies. After some time frequent vomiting ensued, until at length the stomach became so exceedingly irritable, that almost everything taken was immediately returned; these symptoms continued until the patient was reduced to a condition of great debility: on some amendment taking place, she was, under medical advice, sent into the country. For a short time some slight advantage appeared to result from the change, but within a fortnight of her leaving home a communication was received by the friends, suggesting the propriety of her immediate return.

After her return home the indisposition increased, and in addition to constant headache and vomiting, the patient was occasionally subject to a state of extreme prostration, amounting almost to unconsciousness, and in this state she would remain many hours. These attacks continued to recur at intervals through a lengthened period, without any apparent cause, in her then existing, or previous state of health to explain these symptoms.

It was at this time that the patient *first* complained of *pain* in the *gums*; the mouth was examined, and the gums were found to be swollen; the lancet was freely used, and almost immediate relief obtained. Within a week of this circumstance she was sufficiently recovered to leave home for the seaside; the teeth soon came through, and she returned to her friends quite well, *with the important exception that both the vision and the hearing of the right side were found to be considerably impaired*; the former slowly recovered, the latter, though better at some times than at others, has never recovered.

Early in last spring, this patient was observed to be failing in her health, and without any apparent cause. The indisposition was sufficiently marked, however, to suggest the propriety of change of air, and under advice she went for a few weeks into the country. It should be here stated that the patient now remembers that, during this visit, she suffered considerable pain in the gums and lower jaw, and this continued for a short time to trouble her very much; but it was attributed to cold, and an attack of mumps was rather expected.

After a short time, however, the pain passed off, and with the pain all thought on the subject, consequently this annoyance was not at the time mentioned to any one.

The patient returned home, it was thought, in improved health, but still her condition was not satisfactory, neither did she hold the ground she appeared to have gained, but on the contrary seemed to be again failing. A stay at the seaside it was now thought would be an advantage; she at first enjoyed the change, and seemed to be gaining strength, but towards the close of September became evidently anxious to return home. A few weeks after her return home, headache with sickness came on, which was sufficiently severe to require medical assistance; some relief was obtained, and the patient returned to her usual habits; still, however, her state of health was not considered satisfactory.

It should be stated that, on one or two occasions, shortly before the attack about to be described, it was observed that her manner was somewhat strange, yet not in any marked degree, and on the evening previous to the attack she complained of headache, and retired early to rest. The following morning she did not appear at the breakfast table, and was observed to be quite unlike herself; her replies were short and uncourteous, and her manner imperious and contradictory. She continued much in the same state during the day, but towards evening was still more excited; she was delirious and very restless during the early part of the night; the next morning her *vision was entirely lost*, her replies incoherent, and in the course of the following day she became increasingly violent.

From this time convulsions set in, and recurred at unequal intervals during the eight succeeding weeks; there would some times be several attacks during the day, at others a week or less would intervene without any return. The convulsions were of a tetanic character, and remarkably uniform in their course; the patient was almost always aware of their approach some time before they came on, and would request that the necessary assistance might be at hand. In these attacks, the upper and lower extremities were extended to the uttermost, the hands firmly clenched, the thumbs turned inwards, the eyes open, and forcibly converged, and the spine would become arched, so that

the weight of the body rested upon the back of the head and the heels, and thus remain for a considerable time: this condition was sometimes succeeded by violent struggling, twisting, and contortions; there was never any foaming at the mouth or noise. After the convulsions had subsided, a shivering fit followed, and continued for about half an hour: during these attacks the left side generally became rigid, and almost numb. Means were constantly employed to maintain an equal temperature, but with only partial success.

These symptoms continued unabated during eight weeks, the patient suffering constant and distressing headache, great pain at the back of the eyes, with a sensation of their being forced outwards, accompanied with an internal appearance of intense light, extending from behind the eyes towards the back of the head. She had long been too much reduced in strength to bear her own weight, and for a week or two had been losing flesh.

At this period she became the subject of thrush, and it was with the greatest difficulty that even a teaspoonful of fluid could be swallowed, so that for a day or two scarcely any nourishment could be taken. Under these circumstances the state of the patient had become one of extreme exhaustion, and at this time little hope of her recovery was entertained. After a few days an improvement in the condition of the mouth and throat allowed more and more nourishment to be taken, and the patient for a time progressively improved. This progressive improvement did not long continue, but the fits again returned; in the course of a week she had two or three of a milder character, which were followed, however, by the most severe attack she had yet experienced; and during this, the worst fit of all she had endured, her vision suddenly returned. The vision was not, as it will appear, perfectly restored at once, but sufficiently so for general use, and to such an extent as to lead the patient to announce immediately on recovering from the fit, that she had "quite regained her sight."

*At this time the wisdom tooth on the left side of the lower jaw was just through,* and had risen above the gum; on examination it was found that a thin shred of the gum remained stretched over one side of the tooth. This band of gum was divided; in a few days the vision was perfect, and all the other

symptoms rapidly subsided, still leaving the patient in a state of great general debility.

On the day following the fit above referred to, an opportunity was taken for testing the retinae. The patient was, however, so much shaken by the violence of the last attack, that it required to be done quickly, and with little trouble to her.

January 17th.—*Slide 1. Nasal.*—Image of the right eye clearly seen, quite free from shadow, but the lines cannot be discerned; no perception whatever of the image of the left eye.

*Slide 2. Temporal.*—The image of the left eye clearly seen, but the lines cannot be discerned; no perception whatever of the image of the right eye.

Objects appear steady, and she has not the least difficulty in distinguishing colour; form imperfect; the panels of the doors, the window-frames, circles, squares, all appear distorted, and she has deeply scalloped outlines.

The patient, from being entirely blind, has recovered the right nasal and the left temporal halves of the retinae. Corresponding parts of the retinae under corresponding conditions.

20th.—The patient has been rapidly improving, and now walks comfortably with the assistance of an arm, but within the past few days shooting pains have for the *first* time been felt on the right side of the lower jaw, and the gum has appeared slightly swollen. The lancet has been used, but without any apparent relief to the patient.

February 12th.—From the date of the last report until within the past week, the patient has been making rapid progress; subject however, to occasional slight interruptions, she has slept well, her appetite has been good, her vision entirely restored, so that she could see very minute objects perfectly, and without any impatience of light or pain in the eyes; in short, every complaint connected with vision had entirely ceased. The patient had been gaining strength quickly, and was returning to her usual habits; but during the past week her condition has been assuming a less favorable aspect. It has become apparent that her strength has been failing, that she could not walk so well, or with so little assistance, and her

gait has been uncertain and tottering. She has also been complaining of headache, evinced great impatience of noise, and has been painfully sensitive to the slightest vibratory motion, so that the step of any person in an adjoining room, though ever so cautious, has been very distressing to the patient.

Her condition had been thus unpromising, and was becoming increasingly so, when, after a restless night, on awakening this morning, it was found that her vision was again lost. The patient complained of headache, and pain at the back of the eyes; she was excited, extremely irritable, and in manner unlike herself. Towards evening, the pain at the back of her eyes and in the head was better, and she was free from that sense of internal light which formed one of the most distressing symptoms connected with her former attack.

March 18th.—Since the last date the patient has gone on with little variation, having, only in a milder form, nearly all her previous symptoms, excepting convulsions, and the appearance of a bright light in her head and eyes, until within the past three or four days, since which she has been decidedly improving; still no glimmer of light up to last night when she retired to rest. This morning her vision is again restored, there is still slight pain in the eyes, but no impatience of light or other apparent imperfection. On the previous occasion the sight was partially restored at first, and became perfect afterwards; on this occasion it is restored perfectly, and at once.

CASE 8.—December 5th.—An intelligent, well-developed boy, eight years of age, and brother of the patient who forms the subject of the previous report; the countenance pallid, the expression anxious and troubled. For several months past he has occasionally complained of headache, which has generally been accompanied with great irritability. His appetite has been capricious, and his health variable, sometimes considerably impaired, attended of late with loss of flesh, there being no apparent cause to explain these symptoms.

Such was the general condition of the patient, when, about a fortnight since, he became more than usually indisposed; this was attributed to a cold, and he was treated accordingly. About ten days since he went to bed com-

fortably, fell asleep in about half an hour, but aroused in a few minutes, and soon became wakeful and excited; he complained of feeling "miserable all over," with pain in the head, and pain at the back of the eyes; he was exceedingly restless, not remaining for a minute in one position. Sometimes he would desire to sit up, at others to lie down; no sleep came till after 2 o'clock a.m., then a succession of short dozes, broken by constant jerks or starts. This state continued until 6 o'clock a.m., after which he fell into a quiet sleep, and so remained until nearly 8 o'clock, when medical assistance was procured. The symptoms then most apparent were a short cough, with some difficulty of breathing; this not to any great extent, but sufficient to affect him when taking a deep inspiration; these symptoms under medical care were subsiding, still his condition remained unsatisfactory. His nights have been uniformly good, but during the day he has complained of headache, and his spirits have been variable, passing from one extreme to the other. Thus while every function seemed to be going on comfortably, he continued to lose strength, and was becoming thinner; he had also an anxious, careworn look. When, this morning, while at breakfast, chancing to pass his hand over the right eye, he observed for the first time that vision over the left side of the field was lost. The following is the result of my examination:

December 6th.—*Slide 1. Nasal.*—The image of the right eye well seen, with lines and letters.

The image of the left eye entirely lost.

*Slide 2. Temporal.*—The image of the left eye fairly seen, but not with perfect clearness; the lines can be distinguished, but the image is rather shady.—The image of the right eye entirely lost; the images seen do not appear stationary, but when viewed for any length of time they seem to move from right to left, ultimately appearing to pass out of the stereoscope, and are lost. We observe that corresponding parts of the retinæ exhibit corresponding conditions. The left nasal and the right temporal halves of the retinæ are paralysed; and we also observe in the remaining portions of the retinæ, that although the images are for a time fairly seen, they are unsteady, and that when the eyes become fatigued the images disappear.

10th.—*Slides* 1 and 2.—The left nasal and right temporal halves of the retinæ are partially restored ; but the images are deeply shadowed, and they occasionally disappear.

Within the last day or two the patient has been twice observed to turn extremely pale, and look as though he would faint ; while, at the same time, a shudder has passed through his whole frame ; from this he has soon rallied, the countenance resuming its natural colour, and he has appeared unconscious of the circumstance ; his spirits are good, and his general aspect is improved.

14th.—Pain in the eyes increasing ; has had a good night, and is free from headache ; vision is restored to the entire of both retinæ ; his vision, however, is feeble and imperfect, most so over the left nasal and right temporal, the parts first affected ; these portions of the field appear in shadow, and although he can distinguish objects, they quickly vanish ; this vanishing of the images renders it rather difficult to give to the report a very definite character.

He is unsafe to walk alone in the streets ; all objects appear to him as though enveloped in mist, and they are not seen by him until he is quite close to them. If the hand be held three feet before the eyes, and with a good light upon it, the hand appears dark, “like that of a negro,” and the outline indistinct. If held before the left eye alone, the fingers cannot be counted, or any difference observed in length between the fingers and the thumb ; if held before the right eye alone, the hand looks black, but the outline is defined ; in both cases the image is referred to a considerable distance, the distance being greater with the left eye than with the right ; viewed with the latter, the hand appears on the other side of the room, say fourteen feet distant ; viewed with the former, the apparent distance is much increased, as much as “across the road.”

15th.—He states that he has passed a good night, but appears languid, and not so well this morning ; this is explained by the fact, ascertained on inquiry, that he has passed a very restless night, having left his bed at two o'clock, and walked the room in his sleep for about half an hour. The course taken was round a table placed in the middle of the room. He did not touch anything, but continued, at a good walking pace, to pass round and round the table.



After about the time specified he was taken gently by the hand, led towards the bed, and lifted into it, without being awakened or disturbed. There was a light in the room, and it was observed that the eyes were open, and that they were forcibly turned inwards.

About ten o'clock this morning he had a strong shudder pass through him, accompanied with a look of great distress; he became pallid, but without any apparent faintness as on previous occasions, and this was exactly repeated about three p.m.

The pain in both eyes severe, the left most distressing, but without headache. In one respect vision is improved; in another, the reverse; he can see more distinctly, but he is less capable of sustained vision; he is able to distinguish very minute points over the *entire* field, as viewed in the stereoscope; but when his eyes are directed to objects for more than a few seconds, the images begin to move from side to side, and this motion rapidly increases until they can no longer be identified as distinct images; he can distinguish objects at two feet distance, but they appear dingy or nearly black to him.

16th.—He is not looking so well this morning, but reports himself to have passed a good night, and does not complain. I find, however, upon inquiry, that although *sleeping* through the greater part of the night, his rest has been much disturbed. He was not wakeful, but very restless through the whole night; he left his bed five times, and was led back without awakening him; but on one occasion, being in some degree aroused, he appeared extremely irritable. The pain in the eyes continues, but it is more equal; until now the pain has always been greater in the left eye; he is free from headache; his vision, in all respects, remains unchanged.

17th.—He slept well last night, and is at present free from pain in the eyes; he states that he had a "hard thrill" run through his head yesterday, which seemed to settle in the eyes, after which they became very painful, and so continued for an hour or two. The state of vision remains unchanged.

18th, evening.—Very soon after my leaving him yesterday he had another "thrill," followed by acute pain in both eyes, the left eye being the worst. A second thrill almost immediately followed, and in a quarter of an hour two more in rapid succession. The pain became intense. After this he grew

excited and very irritable. These symptoms abated towards the after part of the day, and have now in great measure subsided ; he is looking pallid, and somewhat feeble, certainly not so well as yesterday.

On testing the retinæ, I find the change which has occurred since yesterday is very perceptible. The little fellow retains his vision in degree over the whole field, but it is *much* impaired. He can just discern the forms of slides 1 and 2, but *very indistinctly*. He cannot perceive the lines ; in short, he cannot now discern a *strong* black line drawn across the field ; and white paper looks dark-gray to him, although placed in a bright light. His vision is greatly impaired.

19th.—The patient is extremely prostrate. Very soon after breakfast he had an attack of convulsions ; the attack commenced with extension and rigidity of the extremities, followed by violent flexion and extension of the limbs. This attack has been succeeded by three others during the day ; after the last he appeared to swoon, and remained almost without motion for half an hour.

20th.—The patient is very ill, and has had convulsions repeatedly during the day, as violent as before.

21st, evening.—He has passed a better day, and has had fewer attacks,—shorter in duration, and less violent. Vision is returning ; he can see an object when held at a short distance before the eyes, if it be well illuminated ; but if several objects be placed before him at the same time, they soon appear in rapid motion, and give rise to a feeling of distress which cannot be long endured. He complains that those around him do not sit still—that they cause him great discomfort, by continually jumping up and down. He has a number of acrobat toys, which have afforded him great amusement during his illness, and so familiar has he become with these figures that he has learned to distinguish them by touch, but since the improvement in his vision it has been observed that all but one or two of these figures have been dispensed with,—more of them evidently perplex him.

24th.—The patient appears better ; this is the first day since the 19th that he has been free from convulsions ; he has no headache, but complains of continued pain at the back of the eyes, with indistinctness of vision, so that he cannot deter-

mine the form of any object with which he has not been previously familiar. All things appear to be in motion; but if he place his hand upon an object, the object then appears stationary; and thus by the sense of touch he corrects the fallacy of vision.

26th.—For the first time since his illness he declares himself to be quite free from pain in the head and eyes. He is hopeful; his expression is cheerful, and in all respects his condition appears to be greatly improved.

27th.—Complains of renewed pain in the head and eyes, with great general discomfort; it is evident that he is not so well.

28th.—Passed a quiet night; when partaking of his breakfast this morning had a return of convulsions.

29th.—Continues to lose ground, his convulsions almost as violent as ever. The patient has often stated that his vision is most perfect during his fits—a statement which was last night singularly confirmed. It has been found better not to restrain him during the fits more than can possibly be avoided—restraint tending greatly to excite him, and he will sometimes without notice bound from the bed to the floor. He was last night asked how he could be sure that his vision was most perfect during his attacks; he replied, "Because I can then see distinctly the very smallest thing;" and added, "When I jumped off my bed in the last attack, I could distinctly see a pin upon the carpet, and I saw that it was bent at the point." On search being made, a pin, bent at the point, was found upon the carpet in the direction to which he pointed.

January 6th.—The fits have continued, sometimes with increased violence, and never since the last date has he been free from them for one day: occasionally they have been repeated seven or eight times during the same day; objects have been very indistinct—sometimes he could scarcely see anything, and then only in shadow.

Such has been his condition since the last report, and so much could be ascertained without submitting him to any critical examination; his state having been such as to render it very undesirable to occasion him the least unnecessary trouble. Pain in the head and eyes has been constant—his appetite usually good—his general appearance not much changed; the convulsions during the past two days have been

less frequent, and when they have occurred they have been less violent. The hearing has occasionally been very acute, and sometimes painfully intensified. On one occasion, and subsequent to one of the most violent fits of convulsions he has ever experienced, after lying for more than half an hour apparently unconscious, he sat up and remarked, "I am much better—that last dreadful attack has made me better. I feel well again, and I can now see as I used to see." A newspaper was placed before him, and he immediately read off several words, remarking that the letters did not jump about.

On the following morning the vision had returned to its former imperfect state, and up to this time so remains. The fits have become less frequent, and milder in their character; he constantly springs from his bed, and continues to walk round and round, from left to right, describing a circle of about eight feet in diameter, and this with a rapidity truly surprising; he has himself remarked that this exercise seems *necessary* to him—that it "*works off the strength of the fits,*" and he has begged not to be interfered with on these occasions.

At times he has been painfully sensitive to the slightest vibration. He has had several attacks of convulsions during his sleep; these attacks have been clearly marked, though of a mitigated character; they commence with his stretching himself to the uttermost—the arms and also the fingers being extended to their full length; when this condition has lasted for a few seconds, the face assumes a death-like hue, the hands become firmly clenched, and rigidity of the limbs ensues. After a time, varying in duration from five, to twenty minutes, the hands can be opened—the limbs relax; he falls into a natural position, and all passes off without awakening him. On the morning following these attacks he appears enfeebled, and is conscious of having passed "a bad night."

13th.—The patient is not so well this morning, his manner restless, his vision more indistinct. It is with some difficulty he is induced to look into the stereoscope.

*Slide 1. Nasal.*—Can just discern both halves of the field. The image of the left eye is so dark and shadowy that he would not be able to discern it did he not, from previous examinations, know the form of the object. He has never perhaps been so nearly blind as at this time, excepting for

brief intervals, when it has been doubtful whether he has not quite lost his vision.

14th, evening.—He this morning passed through another violent fit,—shortly before the attack he was nearly blind, and complained repeatedly that there was no light in the room. He tells me at once, however, that he can now see quite *well* again. On examination, I find this report of himself so perfectly correct that I shall simply adopt it. *Every part of each retina* is doing its work, and doing it *well*. This is the second occasion on which the sight of this patient has been restored during a severe fit.

February 15th.—The period which has elapsed since the last report has been unmarked by any particular change; the convulsions have been less frequent and milder; the vision has been variable, but never greatly affected; the general health tolerable, but his comfort greatly marred by nervous irritation. He has occasional fits of remarkable forgetfulness; this peculiarity has been conspicuous on several occasions: for example, he has repeatedly insisted on being rewashed several times in close succession, accusing his nurse of having failed in this part of her duty. On these and similar occasions it is always found necessary to yield to his impressions.

This morning he was observed to clip his words, and there were signs of more than ordinary petulance. Soon after dinner he became much excited—this excitement continued for an hour and a half, when he suddenly gave three convulsive starts, his colour entirely left him, and he would have fallen had not the nurse prevented it; he stretched himself to his full length, the hands became clenched, with the thumbs turned inwards, and thus he remained for several minutes. After this the limbs relaxed, when he appeared as in a fainting fit, and remained perfectly still and unconscious for about twenty minutes; after this he recovered for a brief space, and then had a second milder, and shorter attack.

16th.—Almost a recurrence of yesterday; the attack came on at 4 o'clock p.m., nearly at the same time as that of yesterday, but lasted longer.

April 13th.—The little fellow has gradually improved since the last report, the attacks had become less frequent, and his

symptoms milder in their character, until at length they could scarcely be observed, excepting by those familiar with them. In their last stage they were apparent only on his first awakening, when he was extremely fractious and untractable, with the addition of clipping his words and making use of peculiar phrases, which, to the nurse and the family, were very expressive of his condition.

These remnants of past disturbance had entirely faded out, and the condition of the patient had become so satisfactory that nearly the whole of his days were spent in out-door amusements. Under these circumstances rapid improvement could be observed; his appetite was exceedingly good, the nights were passed in one unbroken sleep, he gained flesh, acquired *more* than his usual health, and it appeared as though his late troubles were at end, when last night, soon after falling asleep, he was again attacked with convulsions; this morning, on awakening, he was rather boisterous, and in the afternoon, about three o'clock, became so unmanageable that his nurse found it necessary to obtain additional assistance; he was much excited, and complained of headache, with severe pain at the back of the eyes, but there was no return of convulsions. The vision became greatly affected, he saw everything as out of place, and all objects appeared distorted or double; on holding a yard measure before him, it appeared like several short pieces, with spaces between them, that is, portions of the image were lost; he could not count three fingers held a yard before the eyes; they "balked" him, he could not tell the number, but "there looked to be many of them."

14th.—He passed a good night, but on arousing this morning was irritable in the extreme, and soon became quite beyond the management of one person. In two hours these symptoms had nearly subsided, and his own manner had returned. He appears to have forgotten the events of the morning, and seems in every respect like himself, but looking sadly; he states that he is quite well, and that he can see everything perfectly. With a view to testing this latter point, his colour-box was brought, and a common engraving placed before him; this he partly coloured, and with a precision which leaves no doubt as to the accuracy of his vision.

We remark the suddenness of this attack, the violence of the symptoms, and the rapidity with which the symptoms subsided. At three o'clock yesterday the vision was good; at seven o'clock it was impaired to a very remarkable degree; this morning, at half-past nine o'clock, the vision, so far as could be ascertained, was without fault.

From the commencement of the attack the mouth of this little boy has been carefully watched; for many weeks there was neither pain nor heat nor swelling in the gums, nor was it until after the symptoms above described had continued for nearly three months that a slight swelling could be observed, situated on the right side of the lower jaw. The lancet was immediately used, and this at intervals has ever since been repeated, but never with any apparent relief to the patient. Two teeth have for many weeks been very nearly through, but although repeatedly lanced, they appear to make little or no progress; he occasionally has shooting pains in the jaw, but the gums are free from heat or pain.

CASE 9.—May 5th.—C. P—, æt. 20, a domestic servant, her father a labouring man, her mother occasionally insane; they have had nine children, five of whom, two girls and three boys, are now living; all excepting this girl are strong and healthy.

For two years past this girl has been subject to fits, and about a year and a half since was obliged to leave her situation, and became an inmate of Kensington Infirmary, in consequence of her liability to these attacks. This poor girl, before she had been long in the infirmary, *lost her vision*, and for a fortnight continued quite blind; subsequently, and during a severe fit, she perfectly recovered her vision. During her stay in the infirmary the gums became swollen and painful, the pain and swelling were in the gum of the lower jaw, on the left side, and far back in the mouth. About this time her health began quickly to improve, and she left the infirmary, soon after which one wisdom tooth, that on the left side of the lower jaw, made its appearance. In a few weeks the tooth of the opposite side came through, without causing any inconvenience. She still continued, however, to suffer from pain in the head, and at the back of the eyes, with occasional fits and repeated loss of vision. This state continued, and

became worse; ultimately she applied for admission at Guy's Hospital, where she was admitted in September, 1862.

It may be briefly stated that this patient remained in Guy's Hospital for months; that during this period she repeatedly lost her vision, and was subject to very severe convulsions, with occasional periods of unconsciousness, attended with coldness and rigidity of the right side. The fits were of a tetanic character, and usually ended in rigid opisthotonos. After remaining in this condition for many weeks, the patient quickly recovered, and coincident with her recovery the two wisdom teeth of the upper jaw were first seen above the gums. She has returned to service; the vision continues perfect, but she has not lost the pain in the head, and her strength is much impaired. On one occasion, when subjected to great fatigue, she suffered a return of the fits.

CASE 10.—October 15th.—Miss —, æt. 24. This lady, evidently not a strong person, has been in a low state of health for some considerable time; her eyes have always been weak; when a child, her studies were often suspended on account of weakness of sight, and whenever she became out of health the eyes were sure to suffer; still it was only a *weak* sight, and until of late she has never experienced any marked disturbance of her vision; indeed, for several years it had been improving, when, about twelve months since, this lady had an attack of scarlet fever, followed by severe rheumatism and impaired health. The first indication she observed of any change in the state of her vision consisted in an apparent cloudiness, the days all appearing to her as though extremely dull, particularly in the morning, but after breakfast the light would appear somewhat brighter; she next found increasing difficulty in reading; she could not see the letters distinctly, although the print was large; still the sensation was that of deficient light, it was like reading by twilight, and very trying to the eyes.

She was advised to rest the eyes as much as possible, and to go to the sea-side. For about a fortnight the change seemed to do good, after which the sight again appeared to be failing, so that the weather, when clear and bright, seemed to the patient to be dull and cloudy. It happened, soon after her return



home, that when desiring to inspect some object, the eye-glass, without being unfolded, was presented to the right eye; while doing this, the left eye was involuntarily closed, when, to the surprise of the patient, she found that the power of vision was entirely gone from the right eye, and these were the circumstances under which the loss she had sustained was first discovered. The following is the result of an opportunity afforded me of testing the retinæ.

*Slide 1. Nasal.*—Image of the left eye fairly seen; no image, or shadow of an image, on the right side.

*Slide 2. Temporal.*—The image of the left eye fairly seen; no image, or shadow of an image, from the right eye.

December 17th.—*Slide 1. Nasal.*—Image of the left eye clearly seen, with the lines. Image of the right eye seen as a shadow, but no lines can be discerned, the form only is distinguished, it is a *shadow* of a semicircle, and it appears to retire far into space, so that the patient could not suppose the image of the right eye to be on a plane even with the image of the left eye.

*Slide 2. Temporal.*—Image of the left eye clearly seen, with the lines upon it. The image of the right eye seen as a shadow.

Evident improvement since the first examination; on that occasion neither the lines nor the figures could be traced, and the image of the right eye was entirely lost; now the form of this image can be traced, although only as a shadow.

January 7th.—*Slide 1. Nasal.*—Image of the left eye clear and distinct. The patient can now also discern the image of the right eye; she can not only distinguish it as a semicircle, but can clearly see the lines upon it; still it is slightly dingy, and it does not appear quite on a plane even with the image of the left eye, but seems somewhat more distant.

March 2nd.—*Slide 1. Nasal.*—Sees both images, the two appear on a plane; that of the left eye is clear and bright, that of the right eye is rather less so, but she sees the lines and small letters on both halves with distinctness.

*Slide 2. Temporal.*—Sees both images, that of the right eye not quite so clear as that of the left eye, but the two are very nearly alike; she can see the lines and small letters on both, with this difference, however—the lines on the image of the right eye appear to be in motion, and they have a wavy effect,

while on the image of the left eye the lines are perfectly steady.

*Colour.*—The image of the left eye quite clear and well defined, the colours bright, and all readily named.

The image of the right eye equally well seen with reference to *form*, but it appears all of one uniform *muddy* tint.

Such being the result elicited by means of coloured objects viewed through the stereoscope, and referred to *distinct* portions of the retinæ, it seemed desirable to ascertain what would be the effect if distinct colours were presented to separate eyes, and under ordinary conditions; with this view a number of stripes of red, blue, and yellow, were arranged side by side, these stripes being about one inch in width, and leaving a space of half an inch between each two of the stripes. When viewed with both eyes the colours were dull, wavy, and blending; it was evident to the patient that several colours were present, but they appeared confused, the *yellow* being the only one that could be well distinguished. When the yellow was withdrawn, and alternate stripes of red, blue, and green, were presented to the eyes, the patient could no longer distinguish any one of the colours; but if one stripe of yellow were placed in the centre, the other colours being ranged on either side, the effect was to “steady the other colours,” and to make them all more perceptible. The stripes, as first placed, were next viewed with the right eye alone, and, under these circumstances, *no one colour could be distinguished*, all were blended into one muddy compound.

Viewed with the left eye alone, the colours were seen *clear and bright*.

This patient has recovered the vision of her right eye, so far, at least, as relates to form, but with this eye the patient is colour blind, although she is not so with the left eye, neither has she ever before been conscious of any deficiency in the power of appreciating colour.

CASE 11.—George P—, æt. 59, servant at a public-house. His sight has never been perfect since he had an attack of typhus fever, thirty-four years ago; he was then quite blind during a fortnight, and his recovery from this state has been only partial; for a long time he continued to lose the lower

half of objects. Ever since this attack of fever his vision has been faulty, and for the past three or four months it has been getting worse. His hearing has never been affected.

*Slide 1. Nasal.*—Sees the images of both eyes, but cannot see the lines; the image of the left eye looks the brighter.

*Slide 2. Temporal.*—Sees but one semicircle, the image of the left eye; sees this very well.

*Form.*—Without fault.

*Colour. Slide 6. Nasal.*—The form on both sides is readily seen, but the colours, which are brilliant, are unperceived; and he describes the entire image as being “round in shape, and of a mud colour.”

*Slide 7. Temporal.*—On the same colours being presented to the left temporal, *he distinguishes them perfectly*, and names them in their order—blue, yellow, red, and green—without the slightest hesitation. This patient, therefore, is *colour blind*, so far as regards the *nasal halves* of the retina; but so far as regards the *temporal* half of his left retina, his power of discriminating colour appears to be perfect. It will be observed that he has lost the temporal half of the right retina.

CASE 12.—March 19th.—John M—, æt. 25, a shoemaker, has been compelled to relinquish his work in consequence of impaired vision; the sight became dim about three years ago, and ever since has been gradually getting worse. He looks well nourished, and states that he has nothing to complain of in his general health; he very easily gets flurried, and when this occurs he quite loses his sight. “A heavy cloud sometimes comes over his eyes, so that it appears quite dark.” This lasts for several minutes; his eyes continue to get weaker.

*Slide 1. Nasal.*—Sees both sides of the field, but very indistinctly, and with much uncertainty. It is with difficulty he can make out that there are two half circles, and that the right half falls down below the left; the image of the left eye appears as a dark shadow, and is scarcely visible. The two images alternate—now one, then the other being lost, and occasionally for a short time both disappear.

*Slide 2. Temporal.*—Sees both sides of the field; the image of the right eye falls considerably below that of the left; both images are very shadowy, but they are steady, and do not alternate.

*Slide 4. Nasal. Small circles.*—The image of the left eye appears “nicer” than that of the right, that is, the outline is more true, the form more perfect; but the two images are constantly changing, more so than with slide 1, first one image then the other appearing, indicating an alternate action of the two nasal sides of the retinæ, this tendency to alternate action not being apparent in the temporal sides of the retinæ.

This man appeared amongst the out-patients of the hospital, and unfortunately did not long continue his attendance, or it would have been satisfactory to have watched the case through a longer period; under the circumstances two examinations only were made, one week intervening between them. The result on both occasions being precisely the same.

In conducting these examinations, there are several points necessary to be observed, the intention being to elicit certain conditions of which the patient is unconscious, and these conditions are of a kind requiring some observation to decipher, and some power of analysis to describe, so that the patient should not be expected to sit down and at once read off what is seen.

The course I would suggest is, that the patient be instructed to look into the instrument, the eyes being directed immediately forward and fixed upon the black spot in the centre of the field, and that the patient should not attempt to describe the result, but should be restricted to answering questions, the questions being arranged with precision, and so framed as to direct the observations without leading the conclusions of the patient.

The phenomena to be observed consist principally in the obscuration, the disintegration, or the loss of portions of the field. The questions, therefore, should have reference to these several conditions. For example: What is the shape or form seen? Do the two halves of the circle come well together? Are the lines perceptible on either, or on both sides? if partially so, where and to what extent? Are both sides of the field the same in colour or brightness? if not, where are they shadowed?

It may be that a portion of one or of both halves of the field is lost, and the patient will not, unassisted, be able to

describe the form as it appears in the stereoscope ; it is better under these circumstances to consider the field as consisting of two distinct halves, and my method has been to place before the patient two semicircles corresponding to those on the slide, being careful to direct the attention to one side at a time. I have usually found that, under these circumstances, the patient will state with great precision the portion they can see ; I have then blacked over the lost portions, and the patient has readily pointed out any deviation from the image seen in the stereoscope.

Again where there is a want of binocular coincidence between the great divisions of the field. The patient may state that the right or the left side is higher or lower than the other, that the two sides slope away from each other, or that the one overlaps the other ; still they will fail to give an exact account of these appearances ; but if two semicircles of white cardboard be provided, they will, without difficulty and with great precision, place these portions in accordance with the stereoscopic images. And so with distorted vision.

The patient who is accustomed to the perplexing anomalies of impaired vision, will probably pay little or no regard to some apparently slight irregularity of form ; an indentation here or a thickening of the line there, are matters of which, unassisted, they will take no heed ; but on directing the attention to the outline and to the form, every fact may be elicited—thus, Is the line the same thickness throughout ? is it a true round ? or square ? as the case may be. And so with reference to notched or scalloped outlines, I have found no difficulty. In several cases that have come under my notice the patients have described them with great readiness, giving their number, depth, and position.

The above observations have special reference to those whose habits have not been such as to accustom them to observe, and who have not the power to explain accurately what they see ; and such as these abound in hospital practice. But where the patient is one of education and intelligence, the process becomes very simple ; in these cases they have themselves repeatedly drawn for me the exact appearance of the field, as seen by them in the stereoscope ; and one of the examples selected for my illustrations has been literally taken from the

drawings furnished to me by the patient himself. The case No. 4 is that referred to.

In taking notes of the state of the retinæ, it is important to observe one form, both in reference to the order in which the observations are taken and also with reference, not merely to the part of the retina to which they refer, but also to the *eye* with which they are connected. With this view it is better *not to identify the image with the side of the field*, but to *connect* it with the *eye* to which it belongs, noting it thus—the image of the right eye, or the image of the left eye. Attention to this point is desirable, because when using slide 1 the image belongs to the eye of the corresponding side; but in slide 2 the images are reversed, so that when the patient speaks of the image of the left side it means the image of the right eye. Hence it is desirable to connect the image, not with the side of the field to which it is referred, but to the eye to which it belongs. Attention to this point becomes important when the patient has lost the temporal half of one eye while the other is retained; under these circumstances but one half circle will, of course, be seen, and it is not always so perfectly easy as at first sight may appear to determine to which eye the half circle belongs. The patient may be requested to close one eye; but many cannot do this, and *none should be relied upon for so doing*. The two halves may be marked with some sign or figure; this is often convenient, and would be conclusive, but it supposes the patient to possess sufficient vision to discern the sign or figure, and this very frequently is not the case.

These observations relate to the temporal half of the retina, and the point is, how, when the patient has lost the temporal half of one eye, to determine to which eye the image belongs, the patient retaining sufficient vision to distinguish the form of the semicircle, but not being able to discern any figure or sign upon it. This may be done by ascertaining the *position* of the retinal image, which will appear with the circumferential edges *away* from the *eye* by which *it is seen*; that is, the straight edges will be turned *towards* the eye by which the image is seen; and this point is best determined, not by asking the question, but by placing a semicircle in the hand of the patient, and requesting that it should be placed exactly as it appears in the stereoscope.

The facts above recorded have been gathered somewhat hastily, and from a comparatively limited field; still they have been observed with care, and for the most part have been verified by repeated examples. It is hoped, therefore, that more extended opportunity will tend to confirm them; and although it would be premature to draw general conclusions from data so limited, we cannot but regard with interest the conclusions to which these observations evidently tend. And were all evidence wanting excepting such as may be obtained by means of the stereoscopic test, and gathered exclusively from the pathology of the eye, we think the problem of our last section need not long remain unsolved.

*(To be continued.)*





Fig 1

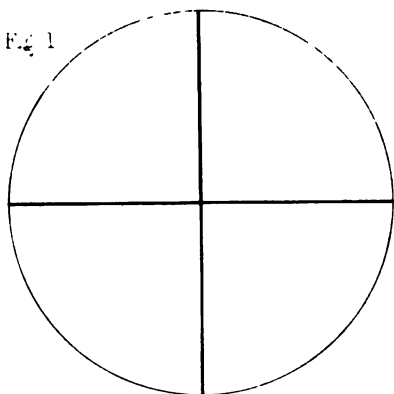


Fig 1.

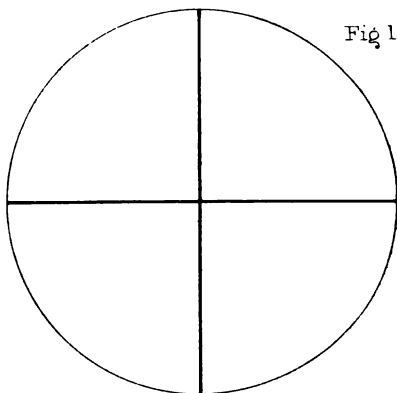


Fig 2

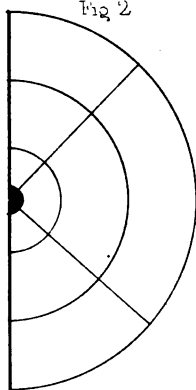


Fig 2.

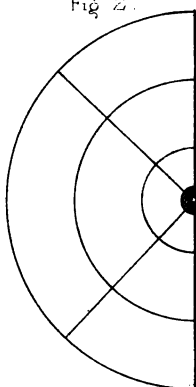


Fig 4.

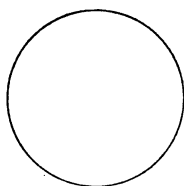


Fig 4.

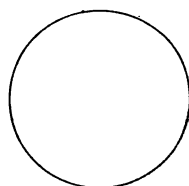


Fig 3.

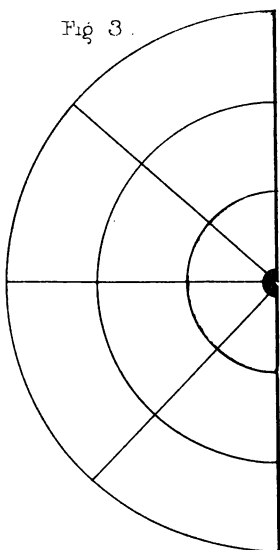
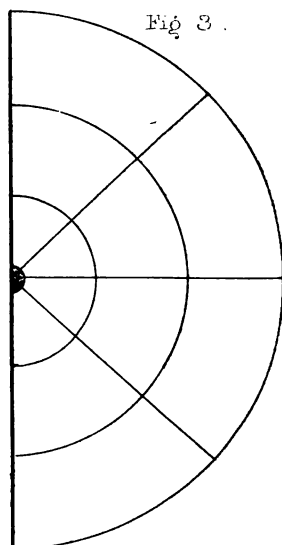


Fig 3.



*Three plates, illustrating the tests for the condition of the  
Retina.*

PLATE I.

- Fig. 1.* Shows the size and relative position of the semicircles forming the slide for the nasal halves of the retinae.
- Fig. 2.* Shows the size and relative position of the semicircles forming the slide for the temporal halves of the retinae.
- Fig. 3.* The entire field for both eyes.
- Fig. 4.* Two small circles, placed at the right distance, for the nasal halves of the retinae.

## PLATE II.

CASE 1.	{ <i>Fig. 1.</i> Left nasal.	<i>Fig. 3.</i> Right temporal.
Jan. 3rd.	{ „ 2. Right nasal.	„ 4. Left temporal.
Feb. 10th.	{ „ 5. Left nasal.	„ 7. Right temporal.
	{ „ 6. Right nasal.	„ 8. Left temporal.

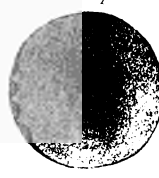
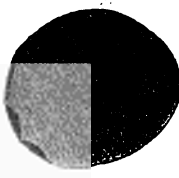
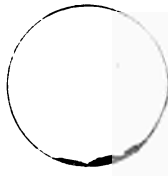
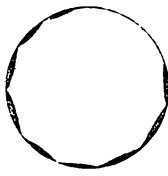
CASE 2. Showing in shadow the portions of the field lost. *Fig. 1*, March 2nd; *Fig. 2*, March 25th; and *Fig. 3*, April 9th, showing progressive paralysis of the retinae. *Fig. 4*, May 5th, exhibits the appearance of the field, when recovery was nearly completed.

- „ 3. Disintegration of the field. *Fig. 1*, showing the relative position of the nasal halves of the field, with shadowed appearance of the image of the left eye; *Fig. 2*, showing the relative position of the temporal halves of the field. *Fig. 3* shows the field disintegrated at the horizontal line, with shadow over the upper part.

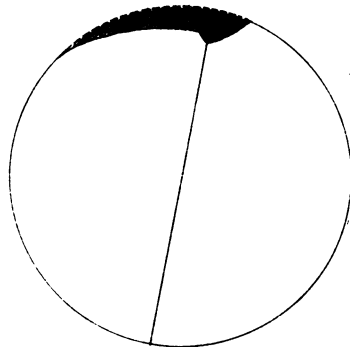
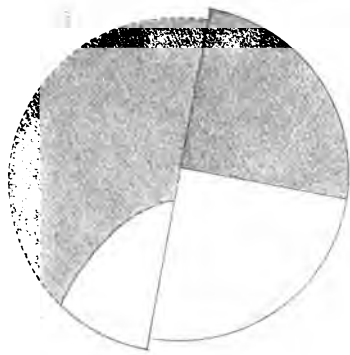
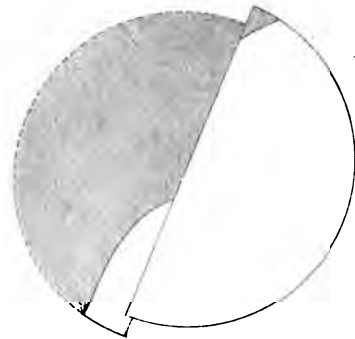
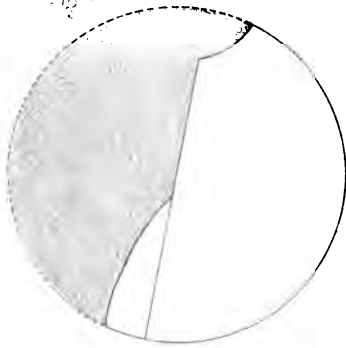
## PLATE III.

- „ 4. Disintegration of the field. *Fig. 1* shows the relative position of the nasal halves, with the image of the left eye deeply shadowed, the lower part being nearly lost. *Fig. 2*. The temporal halves of the field, the image of the right eye deeply shadowed, most so at the lower part. *Fig. 3* shows the field disintegrated at the horizontal line, with shadow over the upper part. *Fig. 4*, distorted square, as seen by the patient; *Fig. 5*, distorted round, as seen by the patient.
- „ 5. *Fig. 1*, the nasal halves of the field, showing the shadowed appearance of the image of the *right* eye; *Fig. 2*, the temporal halves of the field, showing the shadowed appearance of the image of the *left* eye.

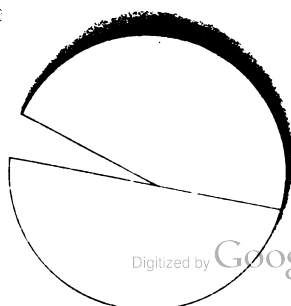
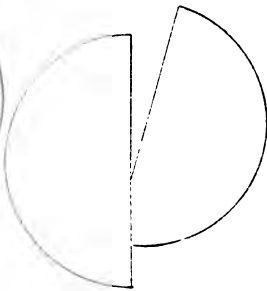
Case 1



Case 2



Case 3

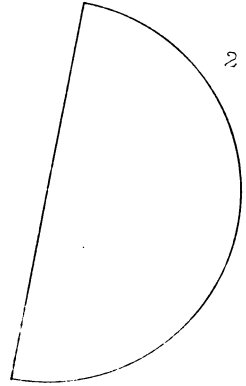
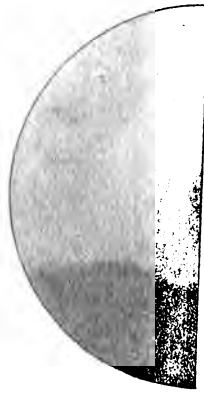
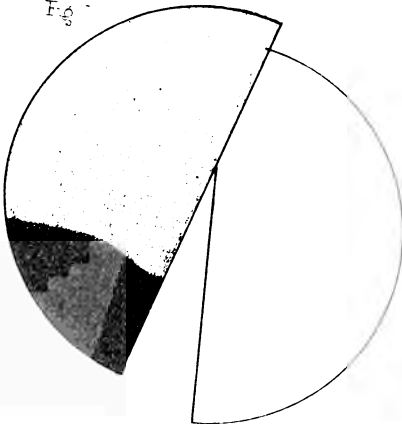




Case 4

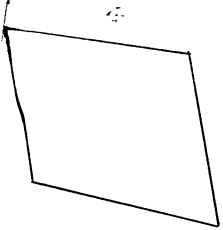
Plat.

Fig

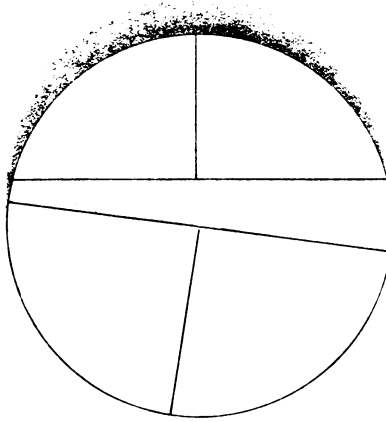


2

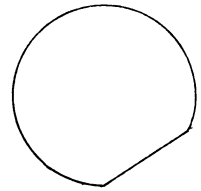
3



4



5



Case 5

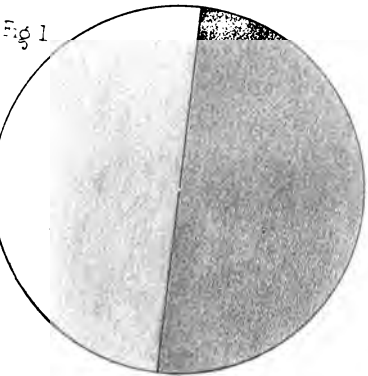
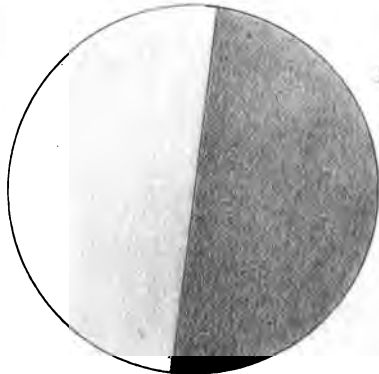


Fig 1



2



# CASE

IN WHICH

## A LARGE QUANTITY OF NITRATE OF POTASH WAS TAKEN MEDICINALLY.

ELIMINATION OF THIS SALT BY THE URINE.

WITH REMARKS.

---

BY DR. WILKS AND DR. ALFRED S. TAYLOR.

---

JOHN D—, æt. 34, was admitted, under Dr. Rees, on September 25th, 1862, for renal dropsy, and was subsequently transferred to Dr. Wilks's care. Nine months before admission, after taking cold, swelling of the legs appeared, and subsequently dropsy of other parts. He was ordered a saline mixture, with antimony and jalap powder. He continued this treatment until October 14th, when, being much better, he was ordered some Vinum Ferri. He was now walking about the ward; but there being some œdema of the leg remaining, Dr. Rees wished to try the effects of large doses of nitrate of potash as a diuretic. On October 28th he was ordered half a drachm of nitrate of potash, in mint water, three times a day. Very little effect was produced on the urine as to quantity, and therefore, on October 30th, the dose was increased to a drachm three times a day. After this he appeared to pass more water, but it was not regularly measured; he walked about the ward, and had resumed his ordinary healthy aspect, although some slight œdema of the ankles still remained, and the urine was still albuminous. On the 17th November the dose of nitrate of potash was increased to one drachm and a



half three times a day. This did not produce a marked effect on the system in any way; his digestion was good and his bowels were regular. On the 23rd November his urine was found still albuminous, and of sp. gr. 1027. On the following day (the 24th) it was collected for analysis, the amount passed in twenty-four hours being sixty-four ounces. The patient continued to take the nitrate of potash up to about the 26th December, when the steel mixture was resumed. He left the hospital in the following week.

*Analysis.*—The urine collected on the 24th November was of a somewhat deeper colour than usual, but otherwise presented nothing remarkable in its physical properties. Its sp. gr. was 1029. The solid contents amounted to 5·8 per cent. In the entire urine the chlorides and sulphates were more abundant than they are commonly found.

As the object was chiefly to determine the elimination of *potash*, twenty ounces of the urine were evaporated to dryness, and the residue incinerated. The residue left a white ash, weighing 178 grains, the greater part of which was dissolved by water, forming a strongly alkaline solution, which effervesced on the addition of acids (alkaline carbonate). The amount of potash contained in this soluble residue was found to be 43·87 grains. The proportion of this alkali contained in urine is liable to great variation; but according to a recent analysis of healthy urine of a sp. gr. of 1020, leaving a solid residue of 4·4 per cent., the proportion of potash in 1000 grains is 1·93 grains. (Miller.) Calculated for twenty ounces of the liquid, this would be equivalent to 17·83 grains, and thus in the above sample of urine there was apparently an increase of 26·04 grains. The increase may, however, be more correctly determined by comparing the proportion of potash to the fixed saline matter in normal urine. Here, again, we meet with differences according to age, sex, state of health, abstinence, &c. The normal urine, above referred to, of a sp. gr. of 1020, yielded by the evaporation and incineration of 1000 grains, 13·35 grains of fixed salts, the potash contained in these salts weighing 1·93 grain. In 178 grains of saline matter (from the sample analysed) there would, therefore, be 20·78 grains of potash, showing an increase of 23·09 grains over the normal average. Hence the quantity of potash

was more than twice as great as that found in ordinary urine. This alkali was readily detected by igniting the saline residue in a smokeless flame; and by the employment of an indigo screen the yellow light of sodium was entirely cut off, and the purple flame given by potassium was remarkably striking.

According to Berzelius, 1000 grains of normal urine yield 15.29 grains of fixed salts, of which sulphate of potash forms 3.71 grains. This is equivalent to two grains of potash. Hence, according to this authority, the potash in normal urine forms rather more than one seventh part of the weight of the fixed residue. This does not differ materially from the proportion in the sample taken as a standard of comparison, although the total quantity of fixed salts is greater. The proportion of potash in normal urine may be taken as ranging from one seventh to one eighth part of the weight of the fixed salts. In the sample submitted to analysis it amounted to about one fourth of the weight. The weight of the fixed salts eliminated by the urine in twenty-four hours has been made a subject of investigation by Scherer. According to this chemist, the weights are as follows: in a child, 169.42 grains; in a boy, 159.84 grains; in a young man, 364.64 grains; and in a man in a state of abstinence, 55.8 grains. The proportion of fixed salts contained in the urine submitted to examination, was considerably greater than in any of the instances assigned by Scherer. Thus, as 178 grains were found in twenty ounces of this urine, while four pounds, or sixty-four ounces, had been passed by the patient in the preceding twenty-four hours, the amount of fixed saline matter eliminated during this period would be 569.6 grains. Results of this kind do not admit of any just comparison, unless the amount of urine passed within the twenty-four hours is specified. All other circumstances being equal, the difference would, of course, be great in comparing normal urine with that of a person who was taking daily a large quantity of any neutral salt. The average quantity of urine daily secreted by a healthy adult was estimated by the late Dr. Prout at from thirty to forty ounces. In eighteen cases examined by Dr. Routh the average amounted to thirty-five ounces. Dr. Golding Bird considered that a quantity varying from twenty to fifty ounces was consistent with health, and that less was excreted during summer

than during winter, obviously from an increase in the vicarious functions of the skin during warm weather. M. Becquerel considers that in France the healthy daily average is forty-three ounces in men, and forty-seven ounces in women. The national habit of drinking freely, acid wines having diuretic properties, may account for the difference.

At the period at which this sample of urine was taken the patient passed, in one day, sixty-four ounces, or one third more than the average. This increase was, no doubt, due to the large quantity of nitre which he was then taking; it would satisfactorily account for the great difference in the relative proportion of fixed salts in the urine.

It appears to be conceded by all authorities that the alkali potash is ordinarily eliminated in healthy urine in the state of sulphate. This rule is, of course, interfered with when special salts of the alkali, such as the iodides and bromides, are taken medicinally. One of the objects of the analysis in the case of this patient was to determine whether, in this sample of urine, the potash was wholly or in part eliminated as it was received, *i. e.* in combination with nitric acid, as nitrate. Between October 28th and December 26th, 1862, the patient, a man *æt.* 34, took, in divided doses, one pound twelve ounces and six drachms of nitrate of potash; and as no toxicological effects had ensued, the question was, how had this enormous quantity of a neutral salt been discharged from the system. Twenty ounces of the same sample were evaporated to an extract, and this was treated with successive quantities of alcohol and water, in order to separate, as far as possible, the organic and saline matters. The dark-coloured, aqueous solution obtained, amounting to about four and a half ounces, contained sufficient nitrate of potash to give deflagrating properties to paper which was dipped in it and dried, in spite of the presence of a large quantity of chloride of sodium. Crystals of nitrate of potash were also obtained by spontaneous evaporation. These were identified by their prismatic character under the microscope, as well as by their power of dissolving leaf gold, when mixed and heated with pure hydrochloric acid. That gold was dissolved was proved, not only by its disappearance, but by adding a solution of chloride of tin to the liquid when the purple precipitate of Cassius was

thrown down. A portion of the liquid was completely decolorized by pure animal charcoal, and from this solution more perfect crystals of nitre were obtained. They were, however, intermixed with a large number of cubic crystals of alkaline chlorides, and with feathery crystals of phosphate of soda. The only salts found in the liquid were the chlorides, sulphates, and phosphates, and the only bases were potash and soda.

Assuming that the normal amount of potash was eliminated in this urine as sulphate, the additional quantity of the alkali found in this sample (23.09 grains) would represent 49.61 grains of nitrate of potash in twenty ounces; and this would be equivalent to 2.48 grains of nitre in each ounce of urine. As sixty-four ounces of urine were passed in twenty-four hours, this would be equivalent to 158.7 grains of nitrate of potash carried out by the urine daily, while the patient was taking, within that period, four drachms and a half or 270 grains of the salt in three doses.

As each ounce of urine contained about eight grains of fixed salts, and the calculated amount of nitrate of potash was 2.48 grains, this would lead to the inference that the nitre eliminated by this liquid amounted to from one third to one fourth of the fixed salts. Judging by a microscopical examination of the crystalline residue, I am of opinion that the crystals of nitre did not form more than from one sixth to one eighth part of the crystalline mass. Hence it follows that only one half of the nitre assumed to be present was eliminated as such by the urine. As the sulphates and chlorides were in larger proportion than usual, it may be a question whether some portion of the potash may not have been carried off with sulphuric acid or chlorine. It is not necessary, however, to resort to this hypothesis in order to account for the small proportion of nitre in the urine, or for the fact that while the patient was taking daily 270 grains of the salt, not more than 158.7 grains were eliminated by this liquid. There is another channel by which large quantities of neutral salts are carried out of the body, namely, the intestines. It is nearly twenty years since M. de Kramer, of Milan, first announced, as the results of his experiments with this salt, that he had detected nitrate of potash in the blood, urine, and fæces of animals to which this mineral compound had been administered. The

reader will find a full account of these experiments, with the methods of analysis adopted, in the '*Annales d'Hygiène Publique et de Médecine Légale*' for 1843, vol. i, page 417. In reference to the medicinal action of nitre as a diuretic, this case appears to show that an enormous quantity of the salt given daily in safe doses, will fail to produce any marked effect upon the kidneys. The urine and intestinal secretions become charged with the salt, which is speedily ejected from the system. When the dose has ceased to be medicinal, and the salt exerts an irritant or poisonous action, then a powerful effect on the kidneys may be witnessed. In a case reported by M. Cardon, a man swallowed, by mistake, in one dose, three ounces (1440 grains) of the nitrate of potash. Violent intestinal irritation with copious diuresis followed. The first quickly subsided, and was followed by a constant desire for food and drink, with a tendency to emaciation. The patient continued to pass from five to six pounds of urine every night. The urine was found to contain sugar. The presence of nitrate of potash in it is not noticed. These symptoms gradually disappeared ('*Edinburgh Monthly Journal*,' March, 1849, p. 71).

One remark on the toxicological bearing of this case. Nitrate of potash is, beyond doubt, an irritant poison. This has been proved by the experiments of Orfila and others, and the statement is confirmed by the cases which have been published in my work on Poisons (second edition, 1859, page 337). One ounce taken at a dose has destroyed the life of an adult in three hours. Other cases are related in which doses of from one ounce to an ounce and a half, have destroyed life in two and five hours respectively. The symptoms and appearances produced were those of an irritant poison in all these cases. The poisonous action of a substance of this nature is dependent on the dose taken at any one time, as well as on the frequent repetition of the dose. It does not appear that, in this case, my colleague, Dr. Wilks, gave at any one time a larger dose than one drachm and a half (ninety grains), and this only three times a day. There was, therefore, ample room for elimination, both by the bowels and urine; and no danger that such an amount of the salt would accumulate in the body as to produce symptoms of poisoning. When these

precautions, regarding the dose and frequency of administration are observed, almost any amount of an active poison, and, *a fortiori*, of a neutral salt like nitre, may be passed through the system, not only without danger to life, but sometimes with actual benefit in its medicinal operation. In a period of fifty-nine days this patient took a quantity of nitre amounting to twenty-eight fatal doses; and at no time more than a fatal dose (in divided portions) over a period of *two days*. The rapid passage of the salt out of the body accounts for the immunity of this patient from any toxicological effects. Had the quantity thus spread over two days been given in a single dose, there is no reason to suppose that this man, like others, would not have succumbed to its poisonous action.

I am indebted to my colleague, Dr. Wilks, for a fact connected with the medicinal use of arsenic, which will serve to illustrate the statement above made regarding the operation of poisonous agents. In treating a case of eczema in Guy's Hospital, he prescribed for the patient, a boy under his care, the twenty-fourth part of a grain of arsenic three times daily, making one eighth of a grain per diem. This was continued for seventy days, so that in ten weeks the boy had taken nearly nine grains of arsenic. As two grains of this substance have proved fatal to an adult, it follows that this boy, in the period stated, had taken sufficient arsenic to destroy four adults. Dr. Wilks sent to me the urine daily for examination, and arsenic was found in it. There was no doubt that elimination and absorption went on *pari passu*, and that while this mineral, in passing through the system, exerted a medicinal action, it did not so accumulate in the body as at any time to manifest the usual toxicological effects. When the arsenic was wholly withdrawn the proportion in the urine underwent a daily decrease, more and more of the urine being required in order to demonstrate its presence. It was found in this secretion up to the tenth day, when the patient, who imagined he was being made the subject of experiments, suddenly left the hospital, and could not be afterwards discovered.

ON THE  
COOLING OF THE HUMAN BODY AFTER  
DEATH.

INFERENCES RESPECTING THE TIME OF DEATH.

OBSERVATIONS OF TEMPERATURE MADE IN 100 CASES.

---

BY DR. ALFRED S. TAYLOR AND DR. WILKS.

---

ON the discovery of a dead body, it is sometimes material for the purposes of justice to determine, on medical principles, the period at which death has probably taken place. One condition of the dead body, namely, the coldness or loss of heat as the result of dissolution, has been for a long time considered to furnish a scientific basis for a medical opinion; but when medical evidence on this point is closely examined, it will be found that the opinions are commonly speculative, and that no accurate observations have been made by the individuals. Hence when the question arises, it is not surprising that the medical opinions elicited are of the most conflicting kind. It is with a view to supply some information of a more accurate nature that we have here collected one hundred cases of deaths in Guy's Hospital, commencing with the present year, and have noticed in the respective columns—the age, the cause of death—the time of death—the temperature of the air, as well as wetness or dryness, and the temperature of the body at one or more intervals after death. As the object of these researches was of a practical character, the temperature of the body was taken by placing the naked bulb of a good thermometer uncovered on the skin of the abdomen. The trunk retains the heat longer than the limbs, and thus serves to mark the period of the duration of heat on the surface of the body.

No special notes have been made with regard to the amount

of post-mortem rigidity and degree of decomposition, except the body has presented anything remarkable in these respects.

Most cases are inspected within twenty-four hours after death, when, as a rule, the body is rigid, and no decomposition has taken place.

If after two or three days much change should be present, it is generally to be attributed to some peculiarity in the cause of death. The decomposition is not shown, as at a still later period, by a mere change of colour, as a greenish hue on the abdomen, but by a redness of the whole body, and by dark lines of staining in the course of the superficial veins. Even when these changes are scarcely observable, there may be found considerable alterations within the body, shown more especially by discoloration of the heart and arteries from the hæmative of the blood. These changes are connected with a diseased state of the blood, and are met with in those who have died of fever, pyæmia, and similar maladies.

As a rule, the bodies of those who have been long ill and are emaciated, remain unchanged for a longer time than those who have died from acute disease.

It is observed, that the bodies of persons who have been killed whilst in good health, often undergo rapid decomposition. Of this class of cases also are those of strangulated hernia, where death speedily follows an operation: here the post-mortem changes are sometimes observed to be very rapid.

It is a fact of common observation, that the temperature of fat bodies is retained for a longer time than in those which are thin or emaciated.

It is also a common observation, that moisture in the atmosphere appears to favour decomposition much more than heat; thus putridity is much more rapid on a moist winter's day than on a hot dry day in summer.

These facts might be illustrated by cases from the records, when a casual inspection affords examples of this kind.

September 30th.—The body of a man who had been killed was examined thirty-eight hours after death; it had begun to undergo decomposition in the ordinary manner. The body of another man, who had died of phthisis, was examined forty-four hours after death, and in this, there was no trace of decomposition.

On the following day an inspection was made of the body



of a man who had died a few hours after fracture of the ribs. Only forty-eight hours had elapsed since death, but considerable decomposition had already taken place. Sometimes decomposition is so rapid that in a few hours the features of a person are unrecognisable, although the explanation is not apparent.

James C—, æt. 26, died on November 28th, of typhoid fever, and perforation of the ileum. The weather was cold and moist. When the examination was about to be made in sixteen hours, the body was totally unlike that of the man when alive. There was no rigor mortis; the whole body was bloated; the cellular tissue was emphysematous, so that when the skin was pierced the gas which escaped was easily ignited into a flame. The colour of the surface was of a reddish hue. The internal organs were also much decomposed; of a dark colour, soft, and emitting a very fetid odour. The liver was full of air. The patient was a temperate man, residing in the country.

Timothy C—, æt. 35, shot himself with a pistol, producing fracture of the skull and injury to the brain, from which he died in six days.

On December 13th, the atmosphere being cold but moist, the body was brought into the post-mortem room for examination, being thirteen hours since death. The rigor mortis was imperfect, but still present to a slight degree; the body was warm; when opened, it showed that a remarkable change had taken place internally, so that it was even suggested whether decomposition had not taken place during life. The brain, besides being sloughy, was rapidly decomposing; the lungs showed an early inflammation, and the tubes were deeply stained by imbibition; the interior of the heart and arteries was of a dark-purple colour, and the clots in the heart were mixed with air; the peritoneum was discoloured; the liver presented a very remarkable appearance, it was full of air, and thus resembled very much a mass of fermenting dough; on the surface were bubbles of air ready to burst; the organ contained two small pyæmic abscesses; the spleen was of a greenish colour; the kidneys closely resembled the liver, being, like it, emphysematous from decomposition, and containing air-bubbles throughout its substance.

It has been said that perforation of the stomach has, for one of its causes, a hot state of the weather, such as may promote decomposition, but our post-mortems do not prove this, indeed they fail to show any definite cause for the occurrence. It may be said, in a word, that a post-mortem perforation is extremely rare, not being found so often as once in five hundred cases. In the last two cases one was albuminuria, and the other a head affection; but in neither could there be found any peculiarities as regards the food, the time of the last meal, or the state of general decomposition, to account for the circumstance. There are, probably, some hidden chemical causes to account for its occurrence, than the more apparent ones which are evident to the eye.

We may also allude here to another point of interest, as it is one which does not seem to be generally known to the profession, and that is, that blood readily coagulates after death. When a body is examined within eight to ten hours after death, it is not unusual to find the blood which may have flowed from it forming a firm clot on the table; or, as is more usually the case, the blood which flows from the vena cava into the chest coagulates there, so that after removing the lungs and heart, and spending some little time in demonstrating their morbid alterations, on returning to the body a very firm coagulum may be found, occupying the chest on either side.

In the first 27 cases of the following table no note was taken of the time that the body was in the ward, and therefore the observations are only of comparative value, the temperature of the dead-house being considerably below that of the ward. As a rule, the body lies in the ward for two, three, or four hours. If death takes place late in the evening, it lies in the ward all night—for ten or twelve hours. The first note made of the temperature, was generally shortly after the body was brought to the dead-house, having been in the ward for very different periods. Beginning with the 28th case, a note has been taken of the temperature of the ward, and how long the body had lain in it. The most complete observations commence with case 62, where the temperature of the body, when first brought to the dead-house, was also taken.

*Observations of Temperature*

No.	Date.	Name and Age.	Cause of Death.	Time of Death.	Temperature of Ward.	How long in Ward.
1	1863 Jan. 21	Joseph Salt, 53	Bright's disease and erysipelas	2 p.m.	—	—
2	„ 22	James Ellis, 72	Lithotomy ; pneumonia	11 a.m.	—	—
3	„ 26	Sarah Ann Bedford, 37	Tumour uterus ; hæmorrhage	12 nocte	—	—
4	„ 25	James Dodd, 60	Injury to leg ; fatty heart. Sudden death	8 p.m.	—	—
5	„ 27	John Ingram, 56	Bright's disease	9 a.m.	—	—
6	„ 28	Manuel Rajas, 17	Measles ; broncho-pneumonia	9 a.m.	—	—
7	„ 29	Jemime Goalter, 56	Removal of tumour ; hæmorrhage ; ligature of carotid	9 p.m.	—	—
8	Feb. 3	Elizabeth Dyke, 36	Pelvic cellulitis ; peritonitis	1½ p.m.	—	—
9	Jan. 30	James Goodwin, 56	Cut throat ; Bright's disease ; pneumonia	9 a.m.	—	—
10	„ 30	Alfred Gould, 22	Phthisis ; diffused tubercle	8½ p.m.	—	—
11	Feb. 1	Edward Moftimore, 25	Phthisis	1 a.m.	—	—
12	—	Andrew Dromedus, 26	Measles ; broncho-pneumonia	5 a.m.	—	—
13	„ 4	William Fosbury, 51	Softening of spine	12 noon	—	—
14	„ 5	Naomi Thimbleby, 65	Strangulated hernia	9½ a.m.	—	—
15	„ 5	Richard Suart, 27	Fractured spine	7 p.m.	—	—
16	„ 5	Samuel Frost, 32	Phthisis and Bright's disease	12 night	—	—
17	„ 7	George Lamport, 29	Tubercular meningitis	12 noon	—	—
18	—	Susan Bird, 40	Cancer—uterus	9 a.m.	—	—
19	—	Margaret Dunn, 37	Deformed chest ; bronchitis	7 p.m.	—	—
20	„ 9	John Montenegro, 26	Measles and broncho-pneumonia	9 a.m.	—	—

made in One Hundred Cases.

Temperature of Dead House.	First Observation, dating from time brought to Dead House.	Second Observation, dating from same time.	Third Observation, dating from same time.	Fourth Observation, dating from same time.	No.
42°, dry	2 h., 72°	4 h., 75°	6 h., 72°	12 h., 62°	1
50°, dry	2 h., 74°	—	—	—	2
48°, dry	9 h., 64°	12 h., 60°	14 h., 58°	—	3
49°, dry	—	18 h., when inspected, 75° internal temperature	—	—	4
48°, dry	4 h., 80°	6 h., 77°	—	—	5
42°, dry	2 h., 70°	4 h., 66°	12 h., 61°. Post-m. inspection 2½ days, rigidity disappearing, but still present	16 h., 55°	6
48°, moist	13 h., 79°	17 h., 70°	—	—	7
48°, dry	4 h., 86°	11 h., 58°	—	—	8
50°, moist	3 h., 87°	5 h., 70°. Inspection, warm and rigid	—	—	9
48°, moist	12 h., 68°	16 h., 63°	—	—	10
46°, moist	12 h., 63°	20 h., 56°	—	—	11
46°, moist	8 h., 72°	17 h., 58°	—	—	12
48°, dry	—	5 h., 75°. Arms and legs pliant and not quite cold	10 h., 58°. Still pliant	12 h., 56°	13
48°, dry	3 h., 65°. Warm; pliant	7 h., 63°. Warm; pliant	—	—	14
50°, dry	—	13 h., 70°. Pliant	—	—	15
50°, dry	—	12 h., 75°	—	—	16
52°, dry	3 h., 86°	5 h., 82°	10 h., 63°	21 h., 46°	17
52°, dry	—	6 h., 80°	8 h., 75°	10 h., 60°	18
46°, wet	—	4 h., 75°	13 h., 68°	24 h., 50°	19
42°, dry	—	4 h., 79°	8 h., 73°	13 h., 68°; 24 h., 52°	20

No.	Date.	Name and Age.	Cause of Death.	Time of Death.	Temperature of Ward.	How long in Ward.
21	1863 Feb. 9	William Richman, 25	Diseased heart and dropsy	5 p.m.	—	—
22	„ 11	Charles Denny, 28	Phthisis	10 a.m.	—	—
23	„ 13	Michael Lenway, 36	Disease of heart	11 p.m.	—	—
24	„ 14	Edward Bayfield, 40	Brought in dead. Fall from height	5 p.m.	—	—
25	„ 15	Mary Riley, 38	Heart and dropsy	8½ p.m.	—	—
26	—	John Landen, 44	Bronchitis	9 p.m.	—	—
27	„ 16	John Mappin, 47	Three weeks after injury to arm, died of hæmorrhage	8½ a.m.	—	—
28	„ 19	Charles Tritton, 24	Railway accident (arms, legs, skull, &c.)	1.55 p.m.	—	1½ h.
29	—	George Tenners, 34	Phthisis	12.30 p.m.	—	3 h.
30	„ 20	Anne Annett, 72	Cancer of peritoneum	7.30 a.m.	—	1½ h.
31	—	James Ives, 50	Apoplexy	7 p.m.	58°	2 h.
32	„ 23	Richard Stuvell, 60	Cancer of Chest	5 a.m.	60°	4 h.
33	„ 24	Thomas Ralph, 34	Bright's disease	8 p.m.	62°	1 h.
34	„ 25	George Robinson, 65	—	7 p.m.	56°	1 h.
35	—	Robert Schbles, 14	Sloughing sore and Bright's disease	6 a.m.	56°	2 h.
36	—	William Hunter, 25	Disease of heart	6.30 p.m.	60°	1½ h.
37	—	Sarah Pickering, 56	Disease of heart and dropsy	6 p.m.	60°	2 h.
38	„ 26	Ambrose Gibbon, 50	Phthisis	11.30 a.m.	62°	1 h.
39	„ 27	Michael Sullivan, 42	Sudden death in Accident Ward (no post-mortem)	7.30 p.m.	60°	2 h.
40	„ 40	Sarah Stedehy, 36	Ovarian disease	8.30 p.m.	55°	1 h.
41	March 2	John Jones, 22	Tubercular meningitis	7.15 a.m.	60°	2 h.
42	—	James Brothers, 32	Phthisis	4 p.m.	60°	2 h.
43	„ 4	Edgar Rouse, 10	Chronic pericarditis	1.30 p.m.	66°	2 h.
44	—	Mary Anne Kemp, 5	Fractured skull	5 p.m.	—	2 h.
45	„ 8	Ann How, 60	—	6.30 p.m.	59°	2 h.
46	—	James Powell, 63	Ulcerated leg; pyæmia	11.30 p.m.	52°	9 h.
47	„ 11	Michael Sullivan, 33	Albuminuria	11.30 p.m.	56°	10 h.
48	—	George Grant, 57	Cancer of stomach	11 a.m.	56°	1 h.
49	„ 12	John Cousins, 18	Fractured skull	9.30 p.m.	50°	1 h.
50	—	Francis Cooper, 24	Cancer of leg and lung	11.30 a.m.	56°	1 h.
51	„ 13	Ann Hall, 31	Abscess in brain	3 a.m.	54°	6 h.

Temperature of Dead House.	First Observation, dating from time brought to Dead House.	Second Observation, dating from same time.	Third Observation, dating from same time.	Fourth Observation, dating from same time.	No.
44°, dry	—	5 h., 72°	16 h., 62°	19 h., 60°	21
48°, dry	Arms and legs stiff.	—	—	—	22
42°, dry	80°	10 h., 74°	14 h., 68°. Arms and legs quite rigid	—	23
40°	—	16 h., 69°. Rigid	22 h., 63°	28 h., 50°	24
38°, dry	5 h., 84°. Arms and legs rigid	13 h., 64°	16 h., 62°	—	25
38°, dry	2 h., 80°	15 h., 64°	17 h., 76°, when thermometer placed inside body at time of examination	Body felt warm out- and inside. Ex- tremities rigid	26
38°, dry	12 h., 67°	8 h., 80°. Arms and legs pliant	12 h., 74°	—	27
38°, dry	4 h., 84°	7 h., 73°	17 h., 63°. Left arm (only member left) rigid	—	28
44°, damp	3 h., 80°	7 h., 60°	17 h., 54°. Pliant in arms and legs	—	29
44°, damp	3 h., 70°	5½ h. Post-mortem examination, 84° in interior. Limbs pliant	—	—	30
42°, damp	3 h., 75°. Getting stiff in arms and legs	12 h., 66°. Quite rigid	15 h., 64°	18 h. Post-mortem examination, 60° in interior	31
42°	3 h., 73°. Beginning to be rigid	4 h., 68°	6 h., 67°. Interior of body 85°; rigid	—	32
40°	2 h., 70°	12 h., 65°. Quite rigid	16 h., 61°	20 h., 60°	33
46°	2 h., 75°. Pliant	13 h., 65°	17 h., 60°	—	34
44°	3 h., 73°. Quite rigid	5 h., 70°	—	—	35
44°	2 h., 78°. Quite pliant	13 h., 62°	16 h., 60°	—	36
46°	3 h., 70°. Not yet rigid	6 h., 70°	13 h., 68°	16 h., 63°	37
46°	3 h., 76°	4 h., 70°	—	—	38
48°	1 h., 80°. Quite pliant	11 h., 64°	15 h., 60°	20 h., 55°	39
46°	2 h., 75°	11 h., 72°	16 h., 69°	20 h., 60°	40
46°	2 h., 80°	4 h., 70°	—	—	41
48°	2 h., 73°	5 h., 72°	14 h., 62°	17 h., 59°	42
52°	2 h., 78°	4 h., 84°	6 h., 80°	17 h., 60°; 20 h., 58°	43
54°	2 h., 89°. Quite pliant	5 h., 80°, and 4 h. pliant	6 h., 79°. Getting rigid	14 h., 67°; 18 h., 64°	44
46°	2 h., 83°	11 h., 65°	15 h., 60°	—	45
44°	2 h., 70°	4 h., 57°	7 h., 53°	10 h., 50°	46
43°	2 h., 60°	4 h., 72°	7 h., 68°	10 h., 61°; 12 h., 58°	47
40°	2 h., 76°	4 h., 78°	8 h., 72°	11 h., 68°; 21 h., 54°	48
40°	1 h., 82°	10 h., 65°	12 h., 59°	—	49
38°	1 h., 78°	4 h., 73°	6 h., 70°	9 h., 63°	50
42°	1 h., 76°	4 h., 73°	—	—	51
40°	2 h., 75°	—	—	—	—

No.	Date.	Name and Age.	Cause of Death.	Time of Death.	Temperature of Ward.	How long in Ward.
	1863					
52	Mar. 13	Mary Fennings, 19	Tubercular bronchial glands	2:30 p.m.	58°	1 h.
53	" 14	Thomas Greenrod, 30	Melanotic cancer	8 a.m.	58°	1 h.
54	" 20	John Boyd, 31	Fractured skull	1 a.m.	56°	2 h.
55	—	Samuel Newton, 48	Scarlatinal nephritis	11:30 a.m.	54°	1 h.
56	" 22	Ellen Holt, 19	Phthisis	6 p.m.	62°	1 h.
57	—	Grace Whitmore, 73	Burn	1 a.m.	58°	1 h.
58	—	William Barnes, 46	—	4 p.m.	62°	3 h.
59	" 23	Sarah Edwards, 31	Empyema	1 a.m.	58°	7 h.
60	" 24	James Bannon, 40	Cirrhosis of liver	7 p.m.	60°	1 h.
61	—	Nancy Hoad, 74	Ovarian tumour	1:20 a.m.	62°	7 h.
62	" 26	Thomas Snow, 67	Cancer of stomach. Very emaciated	11 a.m.	60°	2 h.
63	" 27	Abraham Pepper, 41	Diseased spine and paralysis. Moderately wasted	11 a.m.	56°	8 h.
64	—	William Oshorn, 48	Bright's disease, and heart; dropsy	10 a.m.	68°	1 h.
65	" 29	Richard Broughton, 70	Strangulated hernia; peritonitis	2 a.m.	58°	6 h.
66	—	David Jones, 38	?	6 a.m.	60°	3 h.
67	—	Robert Rotherwood, 11	Diseased heart; dropsy	11:15 a.m.	62°	2 h.
68	April 5	Sarah Taylor, 20	Chronic bronchitis; dropsy	1:30 a.m.	58°	5 h.
69	" 9	Edward Lloyd, 60	Erysipelas leg	2:30 a.m.	58°	6 h.
70	" 10	George Harrod, 65	Diseased hand; pneumonia. Moderately wasted	2 a.m.	60°	7 h.
71	" 12	Welby Sherwin, 51	Carbuncle; pyæmia	10:30 a.m.	60°	3 h.
72	" 13	Rose Duncce, 27	Carcinoma breast. Wasted	1 a.m.	58°	8 h.
73	" 14	Mary Parr, 34	Chronic dysentery. Much wasted	7 p.m.	64°	1 h.
74	" 15	John Robertson, 42	Bronchitis; phthisis	4:30 a.m.	58°	5 h.
75	—	Joseph Mallett, 4½	Diphtheria and croup	2:30 p.m.	65°	1 h.
76	—	Thomas Good, 60	Enlarged prostate; diseased kidney	6:30 p.m.	58°	2 h.
77	" 16	Rebecca Hillman, 39	Cirrhosis of liver; Bright's disease	4 a.m.	60°	5 h.
78	—	Sarah Porter, 30	Puerperal phlegmasia dolens	12 noon	62°	1 h.
79	" 23	Emma Everett, 46	Phthisis	12:15 a.m.	63°	9 h.
80	" 24	Thomas Johnson, 60	Calculus bladder; kidney suppuration	6 a.m.	58°	2 h.
81	May 1	Herbert Frost, 18	Tetanus, from wound arm	7:30 a.m.	58°	2 h.
82	—	James Briffett, 22	Pneumonia or phthisis	10 p.m.	56°	11 h.
83	" 2	John Hone, 63	Fractured leg. Amputation	7 a.m.	58°	2 h.
84	—	Enoch Davis, 58	Tumour leg. Amputation	11 p.m.	58°	9 h.
85	" 4	Augusta Aubery, 63	Fractured ribs	3 a.m.	58°	6 h.
86	—	Elizabeth Barrett, 24	Typhoid fever	11 a.m.	67°	2 h.
87	—	Thomas McDougell, 32	Cancer liver, &c.	11:30 a.m.	60°	3 h.
88	" 5	Joseph Bowyer, 47	Cancer rectum, &c.	10 p.m.	62°	10 h.
89	" 7	Thomas Letton, 13	Tetanus. Injured arm	6:45 a.m.	60°	2 h.
90	" 10	George Williams, 43	Epilepsy, from diseased brain	4 a.m.	62°	5 h.

Temperature of Dead House.	First Observation, dating from time brought to Dead House.	Second Observation, dating from same time.	Third Observation, dating from same time.	Fourth Observation, dating from same time.	No.
42°	2 h., 78°	7 h., 71°	10 h., 64°	17 h., 58°	52
42°	2 h., 80°	4 h., 77°	5 h., 75°	7 h., 90°, in interior of body	53
46°	2 h., 78°	4 h., 74°	7 h., 70°	17 h., 66°; 20 h., 64°	54
48°	2 h., 80°	4 h., 78°	7 h., 74°	10 h., 70°; 20 h., 64°	55
50°	2 h., 69°	4 h., 64°	13 h., 56°	15 h., 52°	56
50°	2 h., 69°	4 h., 65°	7 h., 61°	9 h., 59°; 18 h., 57°	57
50°	2 h., 78°	4 h., 74°	13 h., 69°	16 h., 66°	58
50°	2 h., 70°	5 h., 66°	—	—	59
52°	3 h., 80°	12 h., 73°	14 h., 71°	16 h., 70°	60
52°	2 h., 78°	5 h., 75°	—	—	61
45°	86°	2 h., 84°	4 h., 80°	6 h., 76°; 15 h., 62°	62
42°	68°	2 h., 64°	4 h., 62°	6 h., 61°	63
48°	88°	2 h., 87°	Post-mortem examination 29 hours after death. Rigidity almost gone	—	64
52°	78°	2 h., 76°	5 h., 74°	9 h., 69°	65
54°	80°	2 h., 78°	4 h., 76°	7 h., 70°	66
54°	88°	2 h., 84°	4 h., 80°	7 h., 70°	67
—	70°	2 h., 68°	5 h., 66°	14 h., 60°	68
50°	78°	2 h., 70°	4 h., 73°	7 h., 70°; 14 h., 64°	69
52°	79°	2 h., 76°	5 h., 75°; internally 84°	—	70
56°	78°	3 h., 72°	6 h., 70°	9 h., 68°; 19 h., 63°	71
54°	86°	2 h., 84°	4 h., 82°	—	72
52°	78°	3 h., 74°	12 h., 68°	15 h., 64°	73
50°	82°	2 h., 80°	4 h., 76°	—	74
52°	76°	2 h., 74°	4 h., 71°	7 h., 68°; 18 h., 60°	75
52°	82°	3 h., 79°	12 h., 74°	15 h., 70°	76
55°	86°	2 h., 84°	4 h., 82°	—	77
52°	98°	2 h., 94°	—	—	78
54°	76°	2 h., 74°	4 h., 73°	5 h., 76° (inside)	79
52°	82°	2 h., 80°	5 h., 78°	7 h., rigid	80
45°	78°	2 h., 76°	4 h., 72°	—	81
45°	70°	2 h., 68°	4 h., 65°	—	92
48°	84°	2 h., 80°	—	—	83
48°	72°	2 h., 69°	—	—	84
58°	80°. Pliant	2 h., 76°. Rigid	5 h., 73°	10 h., 68°	85
56°	86°	2 h., 82°	6 h., Pliant	8 h., rigid	86
58°	80°	3 h., 76°	4 h., 72°	11 h., 69°	87
52°	85°	3 h., 82°	5 h., 80°. Pliant	7 h., rigid	88
59°	86°	2 h., 84°	4 h., 82°	5 h., pliant;	89
				8 h., rigid	
55°	84°	2 h., 82°;	5 h., 79°;	9 h., 76°; 14 h., 68°	90
		4 h., pliant	7 h., rigid		



No.	Date.	Name and Age.	Cause of Death.	Time of Death.	Temperature of Ward.	How long in Ward.
91	1863 May 10	Emma Burrows, 22	Phthisis	8 a.m.	58°	1 h.
92	—	James Riley, 21	Phthisis	11.30 a.m.	62°	7 h.
93	„ 11	William Jones, 50	Diseased kidney	7.30 a.m.	64°	2 h.
94	„ 17	John Godwin, 65	Fractured ribs; lacerated spleen; internal hæmorrhage	5.20 p.m.	58°	2 h.
95	„ 22	Joseph Peart, 32	Inflammatory softening of spine	7 a.m.	60°	2 h.
96	„ 26	William Ross, 29	Pyæmia, following operation	8 a.m.	58°	2 h.
97	„ 29	Eliza Freeman, 50	Bright's disease	6 a.m.	60°	3 h.
98	June 1	John Cooper, 35 (negro)	—	12 noon	59°	3 h.
99	„ 3	William Mansell, 30	Tetanus	7 p.m.	59°	2 h.
100	„ 7	Kate Arrowsmith, 50	Erysipelas and bronchitis	4 p.m.	59°	2 h.

Temperature of Dead House.	First Observation, dating from time brought to Dead House.	Second Observation, dating from same time.	Third Observation, dating from same time.	Fourth Observation, dating from same time.	No.
55°	80°	2 h., 78°	5 h., 74° ; pliant ; 7 h., rigid	9 h., 70° ; 14 h., 64°	91
56°	78°	2 h., 75°	5 h., 72° ; 7 h., rigid	14 h., 63°	92
55°	87°	2 h., 85°	4 h., 81°	5 h., pliant ; 8 h., rigid	93
56°	84°	2 h., 82°	4 h., 80° ; pliant ; 6 h., rigid	13 h., 69°	94
52°	80°	2 h., 78°	4 h., 76°	6 h., pliant	95
54°	82°	2 h., 79°	4 h., 76° ; 5 h., pliant ; 7 h., rigid	9 h., 70°	96
56°	80°	2 h., 77°	4 h., 74°	5 h., pliant ; 8 h., rigid	97
58°	79°	2 h., 76°	4 h., 73°	5 h., 68° ; 6 h., pliant ; 8 h., rigid	98
59°	82°	2 h., 80° ; 5 h., pliant	12 h., 76° ; rigid	—	99
52°	84°	2 h., 81°	4 h., 78°	15 h., 68°	100

A summary of the observations of the temperature of the dead body, recorded in this table, leads to the following conclusions. If the periods of time be divided, first, into those which are included between two and three hours; secondly, between four and five hours; thirdly, between six and eight hours; and fourthly, twelve hours, including one or two cases extending to fourteen hours; then we find that the results are as follows :

	First period, two to three hours	Second period, four to six hours	Third period, six to eight hours	Fourth period, twelve hours.
Number of observations .....	76	49	29	35
Maximum temperature of body .....	94°	86°	80°	79°
Minimum temperature of body .....	60°	62°	60°	56°
Average temperature .....	77°	74°	70°	69°

As the above periods date from the time at which the bodies were received at the dead-house, it is obvious that the temperatures above given are under rather than over stated. Thus in order to determine how long a period had elapsed since death, the time which the body remained in the ward, must be added to the time at which the observations were made. As this time varied greatly, we have found it impossible to include it in the calculations above given; but the facts show that the dead body cools slowly and progressively, and that, as a rule, the abdomen retains a considerable warmth for upwards of twelve hours after death.

This table illustrates some of those curious conditions which have been occasionally observed in the dead body, and which have as yet received no adequate explanation. In Case 1, of a man, aged fifty-three, who died from Bright's disease and erysipelas, in two hours the body had a temperature of 72°, but in four hours, it was 75°, having thus increased 3°, although the temperature of the dead-house was 42°. In six hours it had attained the same temperature (72°) which was observed after the lapse of two hours.

The long preservation of a high temperature in the interior of the body, is shown in several instances. Thus, in Case 4, when the body was inspected more than eighteen hours after death, the thermometer being  $49^{\circ}$ , the internal temperature of the viscera was  $76^{\circ}$ . In Case 26, more than seventeen hours after death, a thermometer placed in the body, indicated a temperature of  $76^{\circ}$ . In Case 30, the interior of the body examined seven hours after death, had a temperature of  $84^{\circ}$ . In Case 31, twenty hours after death, the temperature was  $60^{\circ}$ . In Case 32, examined ten hours after death, while the exterior of the body had a temperature of  $67^{\circ}$ , the interior was  $85^{\circ}$ ; and in Case 79, the internal temperature, fourteen hours after death, was  $76^{\circ}$ . This occasional increase and retention of temperature in the dead body, has led to doubts in certain cases respecting the reality of death, and has no doubt given rise to the absurd reports of the inspection of living bodies.

As the coverings of the body, at the time of death, have an influence on the rate of evolving, it may be stated, that the practice in the dead-house at Guy's Hospital is to place the body in an open shell. It is simply covered with a shirt, shift, or sheet; otherwise there is nothing to prevent or interfere with ordinary cooling by radiation.

*On the Cooling of the human body after death.*—One of the most striking characteristics of life is the power which the body has of retaining a temperature far above that of the medium in which it is ordinarily placed. Notwithstanding that the body is constantly subjected to the same laws of cooling as all other heated solids, *i.e.* by radiation, conduction, and convection, the supply of caloric internally is so constant and uniform as to counter-balance exactly the loss which is experienced. Some physiologists consider that animal heat depends entirely on the chemical changes produced by respiration; but it is probable that the nervous system plays an important part in its production. When, therefore, life is extinguished, the body will gradually lose the quantity of caloric which it possessed at the moment of death, just like so much inert organic matter artificially raised to the same temperature.

According to Dr. Symonds the mean time for the cooling of the dead human body is fifteen or twenty hours ('Cyc. Anat.

and Physiology,' Art. "Death"); but it will take place with varying degrees of rapidity, according to two orders of circumstances. 1. The manner or kind of death. 2. The physical conditions under which it is exposed.

1. Although the coldness of the adult body is rarely complete until after the lapse of *fifteen* hours from the cessation of life, yet it sometimes cools much more rapidly than this. Thus it may be found cold, even when death is occasioned by violence to an adult in a state of perfect health, in the short period of eight or nine hours, if the circumstances are favorable to the loss of heat. In the case of *Millie*, for the manslaughter of whom a man named *Bolam* was tried and convicted some years since, the body, although clothed, is reported to have been found cold about nine hours after death.

It is customary to judge of the degree of coldness by the sense of touch; but it must be remembered that the dead human skin is a good conductor of heat, and thus the surface may appear icy cold to a moderately warm hand. The condition of the hand itself may lead to an erroneous impression. If the two hands are of different temperatures, a recently dead body may appear cold to one and warm to the other. Another fact should also be borne in mind, that in the chest and abdomen the viscera may retain a well-marked warmth when the surface of the skin is actually cool or cold (see Case 32). The retention of heat may be better determined by applying a thermometer to the skin of the abdomen or of the flexures of the joints (as in the axillæ), or in the mouth, throat, or rectum. In the preceding table the first method of determining external temperature, has been selected for reasons elsewhere assigned.

When death has taken place suddenly, as from accident, apoplexy, or acute disease, a body has sometimes been observed to retain its heat for a long period. It is stated, upon the authority of Nysten, that the bodies of persons who have died from asphyxia by hanging, or suffocation, or from the inhalation of carbonic acid gas, do not cool, *cæteris paribus*, until from twenty-four to forty-eight hours after death; and that sometimes even *three days* have elapsed before the body had become completely cold. Too much importance must not be attached to this statement, since it is quite certain, from recorded facts,

that in some cases of fatal asphyxia, the body has cooled just as rapidly as in death from other causes.

According to Dr. W. B. Richardson, a loss of blood, as in cases of death from hæmorrhage, whether the blood is effused externally or internally, or even temporarily withdrawn from the heart as in syncope, is a cause of the rapid cooling of the body. He states that "the decline of the temperature in these cases is so great, that the external surface of the body may actually run down to that of the air without death" ('Medical Critic,' January, 1863, p. 31). The sudden cold of collapse observed on the surface of a living body is here confounded with the slow and progressive cooling of a dead body. But the cases which have been adduced in support of this view are exceptional instances of disease, and have no practical bearing on the question at issue, namely, the cooling of the body after the sudden death of healthy persons from wounds. Hence the conclusion drawn from them, "if the body is left dead from direct and absolute loss of blood, cooling to the temperature of the surrounding medium is completed, in regard to the external surface, in two hours," may lead to a serious error, and implicate an innocent person in a charge of murder.

It has been suggested that the coldness of the body as a result of disease, whether arising from malignant cholera, phthisis, or other chronic disease, or from death during the stage of collapse in poisoning, might create difficulty in reference to an opinion respecting the date of death. The bodies of persons who have died of these diseases have been found quite cold on the surface within *four* or *five* hours; at least, as cold as the bodies of healthy persons after the lapse of fifteen or twenty hours. In such cases, coldness of the body is commonly manifested before dissolution, in those parts which are the most exposed, as in the extremities of the hands and feet, the nose, and ears. Like all other diagnostic signs, when taken alone, coldness of the surface is open to this objection; but the obvious cause of death, and the emaciated state of the body, as well as the facts connected with the occurrence and disappearance of rigidity, even supposing that no history of the case could be obtained, would be sufficient to remove any doubt. The objection is of a speculative kind, and no instance has been adduced in which these morbid states have led to an erroneous medical opinion.

2. The physical circumstances which influence the cooling of a dead body are precisely those which influence the cooling of all heated inert bodies. 1. The medium in which it is immersed. A body will cool more rapidly in water than in air—a fact which may be important in a question of survivorship in drowning; and it will cool more rapidly in the open air than in a dwelling, on the floor than in bed, or under exposure to a current of air than in a warm, tranquil atmosphere. It will cool more rapidly in a large apartment than in one which is small. The dead human body cools, first, by radiation; second, by conduction; third, if naked and exposed, by convection: consequently its own mass, as well as the nature of the materials with which it is in contact, must modify the results. The body of an adult, *cæteris paribus*, cools more slowly than that of a child, or of an old person; and that of a fat or corpulent person cools with less rapidity than one which is lean and emaciated (p. 181). Again, when the dead human body is placed on good conducting substances, or is exposed to the open air in a naked state, the cooling process will be hastened. If, on the contrary, it is much covered with badly conducting materials, as cloth, flannel, or cotton, and is allowed to remain on a bed, it will require more than the usual period of time to become cold.

The dead body, like so much inert matter, continues to cool until it reaches the temperature of the medium (air or water) to which it is exposed. As the soft solids are not good conductors of heat, the inner parts of the body are much longer than the surface in acquiring the temperature of the surrounding air; and, for the same reason, when once cooled, it is long before they reach the temperature of the air, supposing this to have risen. Thus, if a dead body is cooled to  $60^{\circ}$ , and the air in the room suddenly increases in temperature to  $80^{\circ}$ , the viscera may be found to remain for some time at  $60^{\circ}$ . The dead body is not, therefore, like a minimum thermometer in marking a low temperature, but, like all dead flesh, its temperature rises and falls with the thermometer, although more slowly than other solids possessing better conducting powers.

Mere coldness of the body is not incompatible with a continuance of life; for many morbid causes may modify, or even altogether suspend the production of heat in the living subject. Thus, in syncope or hysteria, it is not unusual to meet with

extreme coldness of the surface ; but this differs from the coldness of death, in taking place over the whole body *suddenly*, and in even preceding the state of apparent lifelessness. It does not depend merely, as in death, on the slow and gradual loss of heat, because it is perceptible even when the body is placed in conditions under which a heated substance would not become cold. Besides, the interior of the body, as the rectum, or throat, will be found to have a higher temperature than the skin of the chest or abdomen. Let us take the opposite condition—Can the warmth of the human body be retained in its normal state for any length of time after death? We might suppose, *à priori*, that this question should be at once answered unhesitatingly in the negative ; but there are numerous authentic observations which show that heat may be sometimes long retained by the dead body, both on the surface as well as in the cavities ; and it has been noticed, in certain fatal diseases, that the temperature has actually risen in the body after death. This exceptional retention of heat has given rise to the erroneous suspicion that the person was still living, as in the following case, a report of which appeared in the ‘Lancet’ some years since :

A servant girl, who had retired to bed in apparently perfect health, was found the following morning, as it was supposed, dead. A surgeon who was sent for, pronounced her to be certainly dead, and stated that she had probably been so for some hours. A coroner’s inquest was summoned for four o’clock of the same day, to inquire into the cause of death ; and directions were given that a post-mortem inspection of the body should be made in the mean time. The reporter of the case was requested to give his assistance. Accompanied by the surgeon, who had been consulted, he went to the house about two o’clock, for the purpose of making the inspection. The deceased was found lying on the bed, in an easy posture, on her left side, her body forming somewhat of a semicircle. The countenance was pallid, but so perfectly placid and composed, as to give to her the appearance of being in a deep sleep. The heat of the body, although she must have been dead *eight or ten hours*, was not in the least diminished. The room was carefully searched, but nothing in the shape of poison, nor any other means of self-destruction, could be discovered :



every article of apparel lay around, as it might be supposed to have been left, by a person going to bed in perfect health as usual. The heat of the body not diminishing, a vein was opened, and various stimuli applied, but without producing any sign of resuscitation. Respiration and circulation had ceased; no artery could be felt pulsating in any part. Two hours had now elapsed since their arrival, and the parties still hesitated to perform the inspection, when a message was sent to them, stating that the jury were waiting for their evidence. The inspection was then commenced; but in moving the body for the purpose, the warmth and pliancy of the limbs were such as to suggest to the examiners that they were inspecting a living subject! The internal cavities were so warm that a copious steam issued from them when they were laid open. All the viscera were healthy, there were no signs of disease;—nothing appeared to account for death, and from what they saw the inspectors regretted that they had not postponed the examination until the signs of death had been more completely manifested! For obvious reasons, the name of the place where this extraordinary case occurred, and the name of the reporter, were suppressed. It is probable that a high temperature was retained by this body for a much longer period than usual after death. There were, however, two physical causes in operation, the influence of which does not seem to have been sufficiently appreciated. The girl died suddenly while in a state of perfect health and vigour; and until the time of inspection, the body appears to have remained in bed closely covered by badly conducting materials; *i. e.* the bed-clothes. The temperature of the room in which the body was found, is not stated; but as the month was October, it was probably not low. The temperature of the surface or of the internal organs was not measured by a thermometer. Although there can be no doubt that this girl was really dead, yet, as a rule, no medical man is justified in making an inspection of a body until after the signs of death (coldness and rigidity) have been clearly manifested. Respiration and circulation had ceased, and no pulsation could be felt in the heart or arteries; the body had been in this state for at least eight hours; hence it is evident that this was not a case of apparent death; the examiners were simply deceived by an unusual retention of heat. Among various cases

observed at Guy's Hospital, and recorded in the preceding table, there is one (No. 26) in which a thermometer placed in the midst of the viscera indicated, in a really dead body, a temperature of  $76^{\circ}$  more than seventeen hours after death, at a period of the year when the temperature was low ( $38^{\circ}$ ).

Doubts were entertained for several days respecting the death of the well-known Professor Dieffenbach, of Berlin. The unusual retention of heat, and the delay of the putrefactive process, led to the supposition that he was only in a state of apparent death. Dr. Symonds relates that the Abbé Prevost having been struck with apoplexy in the forest of Chantilly was taken home for dead, but recovered his consciousness under the scalpel, and died immediately afterwards. ('Cyclo. Anat. and Physiology,' Art. "Death.")

It is scarcely to be imagined that the production of heat should continue in a really dead body; and yet certain facts connected with the malignant cholera, yellow fever, and some other diseases, appear to establish the possibility of this. In some cases of death from malignant cholera, when epidemic in this country, in 1832-3, the body which had become moderately cold, was observed suddenly to resume its warmth, so that the temperature is stated to have risen some time after death as high as  $87^{\circ}$ , although circulation and respiration had entirely ceased. This singular phenomenon, like numerous others connected with that disease, has received no adequate explanation. The death of the persons may have been only apparent and not real; and possibly, a sudden reaction and distribution of blood through the capillary system, may have given rise to the effect observed. The fact of its occurrence must be taken as positive evidence of some latent vital power or chemical force still lingering about the circulating system; for in real death, the animal body, when it has once become cold, is no more capable of spontaneously generating heat within itself, than any of the inert and lifeless solids by which it is surrounded.

In a case of death from Asiatic cholera, Mr. Rumsey observed that half an hour after the complete cessation of respiration and circulation, the muscles of the arms underwent spontaneously various motions of contraction and relaxation, continuing for upwards of an hour, and that although previously cold, they

then became evidently warmer. The restoration of warmth after the body has become cold in such cases, can only be explained by supposing that there still remains about it some lingering trace of vital action ; although this may not be indicated by the presence of the ordinary signs of active life. The facts connected with the production of heat in the dead body, have not received much attention from physiologists.

There is considerable discrepancy concerning the natural temperature of the *living* body. The average temperature of the interior of the body in health, varies from  $98^{\circ}$  to  $100^{\circ}$ . It is liable to be increased in some diseases, and to be diminished in others. In one case of typhoid fever, M. Piorry states that he found the blood to have a temperature of  $113^{\circ}$ ; and the temperature of the uterus during parturition, is said to have been found still higher.

Dr. John Davy met with some extraordinarily high temperatures in the *dead* body. In a case of rheumatism, after the viscera had been exposed for nearly ten minutes, the mercury of a thermometer, placed under the left ventricle, rose to  $113^{\circ}$ , and when in contact with the lobulus Spigelii of the liver to  $112^{\circ}$ . In a second subject, examined *six hours* after death, the thermometer under the left ventricle indicated a temperature of  $108^{\circ}$ , and when in contact with the lobulus Spigelii  $107^{\circ}$ . In these cases, the patients were ill but a short time, and died suddenly; and the temperature of the apartment in which the observations were made, was  $86^{\circ}$ . This increase of temperature after death has been referred to putrefaction; but Dr. Dowler has shown that it takes place soon after death, and before rigidity sets in. Some of the cases reported in the preceding table (Cases 4, 26, and 30), also show that it may take place independently of putrefaction. Dr. Dowler has called this condition, post-mortem calorificity; he has noticed it as a common occurrence, in a warm climate, in the bodies of persons who have died from yellow fever. The heat of the body, according to him, continues to increase for several hours after death; and in one case, after six hours, he found the axilla to have a temperature of  $100^{\circ}$ , and the abdomen, of  $103^{\circ}$ . In another, the temperature of the axilla during life being  $100^{\circ}$ , it was found that in three hours after death, the temperature of this part had risen to  $104^{\circ}$ ; in a third case, a

similar increase was observed in thirty minutes. The highest post-mortem temperatures were observed in the thighs. Thus in a case in which the axilla had during life a temperature of  $104^{\circ}$ ; in ten minutes after death it indicated a temperature of  $109^{\circ}$ , and in fifteen minutes after death, the thigh gave a temperature of  $113^{\circ}$ . When the maximum, which is variable in different bodies, has been attained, the body gradually undergoes the cooling process observed after death, and according to Dr. Dowler, this generally commences with the head. ('*Phil. Med. Examiner*,' Oct. and Nov., 1845, pp. 625 and 359.) In death from malignant cholera, he found that the dead body reached its maximum temperature of  $109^{\circ}$  in about an hour and a half. Dr. Hensley has published, in the same journal, a series of cases in old and young persons, who had died from different causes; these do not show a similar increase of heat, but they prove that after thirty hours, the dead body may retain a temperature two or three degrees above that of the room (March, 1846, p. 151).

These observations, corroborated as they are, to some extent, by others reported in the table, may serve to explain facts similar to those observed in the case of supposed premature inspection just now related, for they show that in some exceptional instances, a really dead body may retain for some hours a temperature as high, or higher, than that which is usually found in the living.

Dr. Dowler considers that the gradual loss of heat in the interior of the body, as determined by a thermometer, furnishes the best test to establish the reality of death. The living body maintains a uniform temperature, independently of that of the surrounding medium; but a dead body, like other inert matter, is governed in its temperature by purely physical conditions, "heating and being heated, receiving and radiating caloric. This is not the result of speculation, but of prolonged and varied experimental research." ('*Phil. Med. Examiner*,' Oct. 1850, p. 606.)

It may be observed that in temperate climates, the signs of death would be sufficiently well marked by the progressive cooling and rigidity of the body, before the application of the thermometrical test to the interior could be made; hence, although it may furnish information that death has certainly

taken place, a medical examiner could come to a safe conclusion without it. The occasional existence of post-mortem calorificity offers no objection to it, since cooling sooner or later follows this condition, as a result of ordinary physical causes. The coldness of the living body in cholera, congelation, hysteria, &c., is a physiological condition, and not the result of physical cooling. If death takes place, the coldness may continue, or the body may again become warm. In either case it passes ultimately, by physical cooling, to the temperature of the medium.

The changes which take place in a dead body before the commencement of putrefaction, may, if accurately observed, enable a medical witness to form an opinion of the time at which the deceased died. The dead body of a person may be found in a house with marks of murderous violence upon it; the crime may have been so recently perpetrated, that the body still retains the warmth and pliancy observed in the recently dead, or it may be found in a cold and rigid state. A person charged with the murder may be able to prove, that he had not been in the house for many hours, or days; or evidence may be adduced to show that he was there at a time which would correspond to the condition of the body when found. In cases of sudden death from violence, or suspected poisoning, a medical man, by observing the state of the body, may frequently form a judgment of the time at which death occurred, and, therefore, of the period at which poison was taken by deceased, or violence was inflicted on the body.

In the following case of murder and suicide, the murderer was clearly pointed out by the difference in the condition of the two dead bodies when they were first discovered. In March, 1836, a man and his wife were found dead in bed, and their bodies were covered with blood, from wounds inflicted on both. In the case of the woman there was a deep incision in the throat, besides a wound under the chin, and another on the side of the head. The man's throat was also severely cut; the razor with which the wounds had been inflicted, was found on the bed, within a short distance of his right hand, as if, in the last act of life, he had endeavoured to throw the weapon from him, but had failed in the attempt. The body of the woman was cold and rigid, that of the man was warm. The

nature and direction of the wounds, and the marks of violence on the woman's person, were such as to render it probable that she had not committed suicide; and the condition of her body showed that she had been dead many hours. On the other hand, the wound in the man's throat was such, that he could not have long survived its infliction; and as his body, when found, was warm and pliant, it was a reasonable inference that the wife had died first, and from wounds inflicted by her husband, as no other person had access to the house. If the body of the wife had been found warm, while that of the husband was cold and rigid, the inference of his having been her murderer (the wound in her throat being of a nature to produce instant or very speedy death) could not have been sustained. In forming a judgment of priority of death in such cases, the sufficiency of the wound to produce instant or rapid death must always be taken into consideration. A person may inflict on another a slight wound, which may prove fatal by hæmorrhage only after some hours, while he may afterwards inflict upon himself a wound which would instantly destroy life. In such a case, the body of a murderer would be found cold, while that of the victim, by reason of the death being more recent, would be warm. In the case of a female who was found dead in her apartment, with her throat cut, in November, 1847, it was ascertained that, when first discovered, the body was so warm as to render it highly probable that the crime must have been committed within an hour. This observation tended to prove the innocence of a party who was suspected of the murder, because it was known that he had been absent from the house for at least five hours.

In the following case, which is a type of many, the theory of suicide was sustained, and that of homicide completely rebutted, by a medical inference from the condition of the body. In August, 1830, the Prince de Condè, or Duke of Bourbon, was found dead in his bedroom, in the Château of St. Leu. When discovered, at 8 o'clock in the morning, the deceased was found partly undressed, hanging by his cravat to one of the window-shutters. The body was cold, and the lower extremities were quite rigid. As in asphyxia from hanging, the warmth of the body is usually preserved longer than under common circumstances, *i. e.*, from twelve to fifteen hours, before

which period rigidity is seldom complete, the medical examiners inferred that the deceased must have died very soon after he had retired to his bedroom on the previous night. As this was proved to have been 10 o'clock, it followed that only ten hours had elapsed—a short time for cooling and rigidity to have taken place. It was thus rendered medically probable that the hanging took place soon after the deceased entered his bedroom. It was alleged that the duke had been murdered, and his body afterwards suspended by his murderers to create the suspicion of suicide. The condition of the body, among other circumstances, was, however, adverse to this presumption. From 10 until 12 o'clock at night, it was proved that there were numerous attendants moving about, near to the duke's apartments. These persons must have heard any unusual noise, which the duke would probably have made in resisting his assailants. But no noise was heard in the apartment at that or any other time, and the presumption of this being an act of homicide was therefore strongly rebutted. Had the body been found warm and pliant, and the joints flexible, the inference would have been that the deceased had died more recently, and therefore at a time when murder might have been perpetrated without attracting the observation of his attendants. As it was, the coldness and rigidity of the body justified the medical opinion expressed, and tended to prove that this was really an act of suicide.

Criminals sometimes unknowingly furnish important evidence in reference to the condition of the dead body. At the Lewes Autumn Assizes, 1860, a schoolmaster named *Hopley* was convicted of flogging a pupil to death. There was reason to believe that the boy had died during the actual beating. The accused stated before the coroner that he went into deceased's bedroom about six o'clock in the morning, and found deceased dead, his body cold, and his arms stiffening. He suggested that he might have died from natural causes. It was proved that the prisoner was heard in the act of beating deceased up to 11-30 on the previous night, and as the body was cold when found, and rigidity was commencing, there was a strong probability that deceased must have been dead at least six or seven hours, and, therefore, at a time when the prisoner was last known to be with him. The body was well developed, co-

vered with bed-clothes, and the temperature not at the time low.

In the case of *Doidge* (Bodmin Aut. Ass., 1862), who was charged with the murder of a man, medical evidence derived from the state of the body of deceased when found, tended materially to corroborate the circumstantial evidence against the prisoner. The deceased was last seen alive at 10.30 p.m., on the night of the 7th June, 1862. He was found the next morning, about 9.30 a.m., dead in his house; he was lying on his face with his clothes on—one arm under the chest and the other by his side. He had received, on the back of the head, some severe blows, which must have proved speedily fatal. The body when found was quite cold, and the members were rigid. It was considered by Mr. Thompson, who saw the body, and myself, that deceased under these circumstances had been dead from eight to ten hours. There was no doubt that this was an act of murder, and that the deceased had been killed while taking off his boots to go to bed. The prisoner was connected with the act by a chain of circumstances. He was seen drinking and conversing on friendly terms with deceased at a beer-shop the evening before. Prisoner left the shop at a quarter-past ten, and deceased at half-past ten. They both lived near to the shop, and to each other. A neighbour of deceased's, who was out as late as twelve o'clock, heard at that time the voices of two persons in conversation in deceased's kitchen. One of them he recognised as that of deceased, and the other as the voice of the prisoner, with which he was well acquainted. This witness heard the voices for some minutes, returned into his house, and went to bed. He was soon afterwards suddenly awakened by a noise like that of a heavy fall proceeding from deceased's kitchen, in which the dead body was afterwards found. His evidence was corroborated by that of his wife, hence it is clear that deceased was alive for some time after twelve o'clock that night. It was further proved that, contrary to his usual practice, the prisoner did not return home to his lodging until one o'clock in the morning; and then, in order to account for his return at so late an hour, he made a statement which was proved to be untrue. The coldness and rigidity of the body, therefore, when discovered at 9.30 a.m., considering the season of the year, and the circumstance that



deceased was in his clothes, were facts in themselves quite consistent with the occurrence of death soon after twelve o'clock at night, or about the time when a heavy fall was heard by the neighbour. Other circumstances, which were proved, left no reasonable doubt of the prisoner's guilt, and he was convicted.

Perhaps no case has brought the importance of questions of this nature so prominently before the public as that of *Gardner*, a chimney-sweep, who was tried and convicted of the murder of his wife, at the Central Criminal Court, in October, 1862.

The prisoner lived with his wife and another woman named *Humbler*. The wife was found dead in her bedroom with wounds in her throat, at eight o'clock in the morning of the 15th September, 1862. The nature and direction of the wounds, the position of the body, and of the weapon, as well as other circumstances, conclusively proved that this was an act of murder; and as there were no persons in the house at the time of the occurrence excepting the woman *Humbler* (the servant) and the prisoner *Gardner*, it followed that one or both must have been concerned in the act. *Gardner* accused the servant, *Humbler*, of having perpetrated the murder during his absence from home; but as there was no evidence against this woman, he alone was subsequently called upon to answer the charge. The facts, as they bear upon the question which we are now considering, are very simple. *Mr. Sequeira* saw the body of deceased, a healthy well-developed woman, *æt. 37*, at eight o'clock in the morning. Her body was found lying on a wooden floor covered with a flannel petticoat and a chemise. The upper limbs were cold and rigid; the face, shoulders, and chest were cold; the neck was so rigidly fixed with the trunk, that the entire body was lifted up with it when the head and neck were raised; the thighs and legs were quite cold, but there was no rigidity in these parts. The only warmth found about the body was in the lower part of the abdomen; and this obviously arose from the contents of the uterus, the deceased being in the seventh month of pregnancy. The opinion given by *Mr. Sequeira* regarding the time of death, before its exact bearing on the guilt of the prisoner could have been known, was that the deceased had been dead *above four hours*,—certainly more than three, and that she could not have been dead

so short a time as two or three hours when he first saw the body. This opinion was corroborated at the trial by another medical witness, Mr. Comley, this gentleman affirming that, considering the general coldness of the body, the deceased when seen at eight o'clock, had been dead above, rather than under four hours. There was a severe wound on the throat involving the superior thyroideal artery and other vessels. From this, about two pints of blood had flowed on each side of the neck on the floor. The larynx had been laid open between the thyroid and cricoid cartilages. Blood had flowed into the windpipe through this aperture, and had thus, by obstructing respiration, produced death by asphyxia.

Without going into all those circumstances which tended to fix this crime beyond any reasonable doubt upon the man Gardner, it may be sufficient to state that the defence turned principally upon the condition of the dead body when found. It was proved that from four to eight o'clock in the morning, *i. e.* for about four hours, the prisoner was absent from home, following his usual occupation as a chimney-sweep. It was contended by his counsel that within this short period the body might have become cold and rigid as it was found, and, therefore, that the murder had been perpetrated by some one during his absence. On this theory the woman Humbler alone was guilty. The facts proved at the trial were, however, considered by the jury to be quite inconsistent with the innocence of the prisoner, and he was convicted of the crime. The commutation of the sentence to penal servitude for life is a clear proof that the authorities did not believe that the man was innocent.

The opinions given by the medical witnesses at the trial, regarding the inference derivable from the state of the dead body, were reasonable, and in accordance with scientific observations. In assigning *four hours* for the almost entire cooling and commencement of rigidity in the dead body of a woman suddenly dying in the prime of life, the body not being exposed to any specially cooling influences, it is obvious that they could not be charged with overstating, but rather with understating, the period of time required. Considering that death had taken place by asphyxia, if they had assigned six or eight hours, it would have been only consistent with ordinary

experience. It is, indeed, more probable that this time had actually elapsed, and that the woman had died in from two to four hours before the male prisoner had left the house, than that her body, under the circumstances proved, had become cold and partially rigid in less than four hours. Irrelevant experiments on animals and theoretical speculations of an *ex post facto* kind, advanced for a particular object after a conviction for murder, should not be allowed to weigh against opinions deliberately formed and expressed by professional eye-witnesses, who, by their evidence on oath, could have had no intention to exculpate one person, or to inculpate another. As this was clearly a case of murder, and one of two persons must have perpetrated it, the more the charge was removed from the man, against whom there was strong circumstantial evidence, the more completely it was fixed upon the woman Humbler, against whom there was nothing but an extemporised medical speculation, that a body dead from asphyxia, not, as it was erroneously assumed, from loss of blood, might become cold and rigid in less than four hours. Had this medical speculation been adopted as true, and acted on *bond fide*, it would have exculpated the man, and have led to the conviction and execution of the woman. By reference to the table at page 192, it will be perceived that the average temperature of the dead body, four to five hours after reception into the dead-house, as observed in forty-nine cases, was  $74^{\circ}$ . In addition to this, there was in this instance a state of rigidity of the trunk and upper limbs not commonly found at so early a period after death. In addition, it will be easy to show that this medical speculation is opposed to the observations of physiologists, who have really studied the changes which take place in the dead body.

As cadaveric rigidity had commenced in the upper part of the body of the deceased when it was first discovered, we may take this as a point of comparison with the actual observations of Nysten and Brown-Séquard. According to Nysten, in cases in which death took place suddenly in healthy persons, either from asphyxia or as a result of hæmorrhage, cadaveric rigidity did not commonly appear until sixteen or eighteen hours after death, and sometimes lasted six or seven days. Brown-Séquard states that in the bodies of healthy persons

decapitated or asphyxiated, cadaveric rigidity did not appear sooner than ten or twelve hours after death ('Proc. Royal Society,' 1861, No. 44, p. 211). Considering these facts, and the circumstances under which this body was found, the assignment of a period of six or eight hours would have been quite within the limits of experience and observation. It has been asserted that death by hæmorrhage, all other circumstances being equal, accelerates the cooling of a body and the access of cadaveric rigidity. This assertion has been made upon cases which have no similarity in their details. The cause of the death of Mrs. Gardner, according to the medical witnesses, was not hæmorrhage, but asphyxia. Admitting that two pounds of blood had been lost, this admission does not affect the medical opinions given at the trial, which were consistent with ordinary experience, and with the other facts proved in the case.

The case of *Jesse McPherson*, for the murder of whom a woman named *McLachlan* was tried at the Glasgow Autumn Circuit, 1862, furnishes an additional proof of the correctness of these views in reference to the bodies of persons found dead from loss of blood. Dr. G. Macleod saw the body of deceased on the night of the 7th July, when it was first discovered. The mean temperature of the air on that day had been 50°. "The rigor mortis was present in all the articulations, but it was then departing. The body was perfectly cold, even on the abdomen, and at the flexures of the joints. On the following day, at 10 a.m., the rigidity had gone from all the joints excepting the knees and ankles. There were no signs of decomposition, and the temperature was very cool, unusually so for the season. The room in which the body had lain was well ventilated, but without a draught. It was below the level of the street, and the body lay on a wooden floor, and was partially covered. Further, death had resulted from violence; it had been attended with profuse hæmorrhage, and the victim was free from disease, in the prime of life (aged 35), and of a thin, wiry frame." Dr. Macleod, considering that the rigor mortis commonly appears in from ten hours to three days after death, and that in sudden death from violence it is only slowly developed, thought it most probable that forty-eight hours after death (at the longest) would represent the time when rigidity

would appear. "The more rapidly it is developed, the sooner it disappears, and *vice versé*. The average period of its disappearance is from twenty-four to thirty-six hours. In the case under review, resting on the same considerations as influenced the opinion formed of the time of the establishment of the stiffening, it was thought that about thirty hours would probably represent the period of the continuance of the rigidity; and by summing these periods—forty-eight and thirty—together, the conclusion was arrived at that about *three days* had probably intervened since death; and it will be remembered that it was afterwards proved that this was, as nearly as could be, the time which had passed between death and the examination of the body."

"Putrefaction appears on an average under a mean temperature in from three to six days. It is influenced by many circumstances, of which the heat and moisture of the surrounding atmosphere, the obesity and age of the person, the cause of death, the position, and coverings of the body, are the chief. In the case of McPherson there was no appearance of decomposition. The cool atmosphere, thin body drained of its blood, the middle age, and thin covering, all opposed its development" ('Account of the Medical Evidence at the Trial of Jessie McLachlan, by G. H. Macleod, M.D.' Glasgow, 1862, p. 8). This medical opinion, formed from the state of the body, tended to confirm that part of the prisoner's story which related to the time of death.

On these occasions, unless we have a due regard to all the circumstances of a case, great errors may be committed. We may assign a period for death which is inconsistent with the proved facts, and thus give impunity to murderers. Ollivier and Devergie were once required to examine a medical report by two physicians, in which they stated that they had found the deceased, a woman, aged sixty, dead in her apartment from strangulation. When the body was found it was lying on the floor, clothed in her usual dress of cotton and flannel, in a state of cadaveric rigidity, with general lividity of the surface of the skin. It was cold, with the exception of a slight warmth which remained in the abdominal viscera when the inspection was made. ("Les viscères renfermés dans la cavité abdominale, ne nous paraissent pas dans un état de

refroidissement complet.") From these data the inspectors came to the conclusion that deceased had not been dead more than from fifteen to twenty hours before the time at which they saw the body. This would have fixed the date of the murderous assault at one o'clock p.m. on the 6th of March, whereas the general evidence tended to show that the crime must have been committed on the night of the 4th or of the 5th March.

Considering that the woman had died from asphyxia, in which case warmth is usually retained, that her body was well clothed, and yet rigid and cold, with the exception of a doubtful trace of warmth in the abdominal viscera, Ollivier and Devergie came to the conclusion that the woman must have been dead for a longer period than fifteen or twenty hours: and, without defining the precise time, which, under the circumstances, was not necessary, they affirmed that there was no medical ground on which such a restriction of the period of death was justifiable. They contended that cadaveric rigidity, when once established, might remain two, three, or four days, according to the season of the year, and other circumstances, and that when it existed, there was no rule by which it could be determined whether the body had been in this state for two or three hours or two or three days (*Annales d'Hyg.*, 1833, i, 212). The retention of warmth by the abdominal viscera may be met with after fifteen to twenty hours, in a much more marked degree than in this instance. In one case, already referred to in the table (No. 26), the temperature of the viscera of the abdomen, more than seventeen hours after death, was found to be  $76^{\circ}$ , although no care had been taken to preserve the warmth of the body.

The observations in this paper have been chiefly confined to the facts connected with the cooling of the dead body. It will be perceived in the table that the subject of rigidity as to its period of access and duration, has been incidentally noticed only in a few cases. At a future time the phenomena connected with rigor mortis may receive elucidation from a further collection of cases.

# ON TUMOURS.

---

By THOMAS BRYANT.

---

It is not my intention on the present occasion to enter minutely into the pathology of the new growths denominated in surgical language tumours, for this has been already well done by modern pathologists, such as Paget, Wilks, Birkett, and others. But, as it is my object to enter into the subject of their diagnosis, and to point out the principal features by which one tumour may be distinguished from another, it will be necessary for such an end to dwell briefly upon the chief characters belonging to their different varieties, and to consider the leading pathological facts connected with their history, development, and growth. In doing this, I shall condense my observations within the narrowest possible limits, seeking to discover the principles on which the development of these structures appear to be based, and the leading features by which they are characterised, rather than the minute differences in their anatomy, or the minor symptoms by which their development may be attended—looking at their pathological features more as a means of diagnosis than as a scientific pursuit, and applying, as far as it lies in my power, the results of scientific knowledge and investigation to purely practical purposes.

## CHAPTER I.

ON SOME POINTS IN THE PATHOLOGY OF TUMOURS TENDING TO  
ILLUSTRATE THE SUBJECT OF THEIR DIAGNOSIS.

As a leading pathological principle it may, I think, be unhesitatingly asserted, "*that all tumours, with the exception of the hydatid, are made up of one or more of the natural elementary tissues of the body, and that in no single example has any extraneous or new element been ever detected.*" For just as the natural body is built up of cells and fibres in one or other of their different forms, so tumours are made up of like elements, although it may be in unequal proportions. Tumours, like the natural tissues, differ, therefore, anatomically, according to the nature of the elementary structure of which they are composed; and this again appears to be materially determined by the part of the body in which they are developed.

From this, therefore, a second leading principle may be fairly drawn, "*that all tumours partake of the nature of the part in which they are developed, and are more or less made up of the elements which naturally enter into its formation.*"

Thus a tumour developed in the stroma of a fibrous structure will probably be fibrous, if connected with bone more or less osseous, and if situated in a gland, it will in all probability partake of the gland structure.

The bearing of these pathological principles upon practical matters is by no means unimportant; for to the surgeon, who has once recognised the true position of a tumour, there is a certain amount of probability as to its nature which will at once suggest itself to his mind. If the tumour be situated in the skin or subcutaneous tissue, there is a strong probability that it will be composed of some one or other of the structures of the tissue. It may be the sebaceous—which is never found in any other position—or the fatty, for these two materials enter largely into cutaneous structures; or it may be one of the



fibrous or fibroplastic nature—fibre-tissue existing freely also in these parts.

Should the tumour be located between the muscles of a part, there is again a probability as to its true nature, which will naturally suggest itself; for, as cellular tissue alone exists in these parts, the tumour will probably be composed of some of its elements, and these, being formed in excess, will give rise to the growth of a fibro-plastic tumour. Should bone, again, be the seat of the disease, some one of the elements of bone will, to a certainty, enter into its formation; the probability of its being an enchondroma, osteoid, or myeloid tumour, naturally presenting itself. And, lastly, should a tumour be present in a gland, such as a breast, uterus, or prostate, the probability of its being an adenoid cannot be overlooked; for pathologists now all recognise the fact of the close resemblance of tumours so situated to the natural gland structure.

These remarks, however, apply principally to simple tumours; for it must be borne in mind that cancerous or embryonic cell tumours may exist in any part, cells entering naturally into their formation.

*All tumours are either simple or cancerous, innocent or malignant; the simple or innocent approaching in their nature the more highly organized natural structures of the body, even to the perfect glandular; and the malignant or cancerous simulating the most elementary or embryonic; for, as the normal tissues were formed from a simple cell, and those of a higher grade from its development, so the cancerous element is a simple cell, or the undeveloped embryonic nucleus.*

In proportion, therefore, to the amount of the cell element in a tumour may its cancerous tendency be determined; and the greater the proportion of the fibrous or well-developed structure, the greater the probability of its nature being innocent or simple. The more a tumour simulates the natural structure of a tissue or gland, the greater is the probability of its being innocent; the more a tumour simulates the undeveloped cell structure, the greater the certainty of its being cancerous.

The formation of simple or innocent tumours is, therefore, to be explained by the unnatural growth or collection of some

one or other of the simple natural elements at one spot; and the formation of the cancerous tumour is to be accounted for by an undue growth and repetition of the embryonic cell or nucleus, which should naturally have passed on to the development of higher structures.

*Tumours never change their original nature, nor pass on nor degenerate into others of a different kind. A simple tumour is simple to the end, and a cancerous tumour is cancerous from the beginning.* This opinion is a pathological fact, which it would seem unnecessary in these days of advanced pathology to lay stress upon; but, oddly enough, an opposite opinion is still repeated in some of the students' text-books, and this being the case, the truth may be again enforced. The above lines are not intended, however, to convey the impression that a patient, the subject of a simple tumour, may not become the subject of a malignant one, or *vice versa*, for such may unquestionably be the case; and after the removal of a simple tumour a malignant one may secondarily make its appearance. But no simple tumour by growth or degeneration will become malignant, as no malignant tumour will become innocent. It would appear, however, that in recurring innocent tumours there exists a tendency for such growths to present on each return, more the elementary character of the malignant growth. *Simple tumours separate tissues in their growth, but never infiltrate; cancerous, as a rule, infiltrate, and rarely separate.* No more important practical point can be brought forward to aid the surgeon in his diagnosis of a tumour than the above. For a simple or innocent tumour, however long it may be in growing, and however large a size it may attain, will never do more than separate the parts between and beneath which it may be developed.

The bones may be absorbed by its pressure, but they will never be involved; and the skin may be so stretched and attenuated by its distension as to ulcerate or burst, but it will never be infiltrated with the tumour's elements. This fact is well exemplified by a close examination of the margin of a cutaneous opening, the result of over distension; for it will appear as if cleanly cut, or rather punched, at its edges, and never thickened or diseased.

With the majority of the cancerous tumours, however, a very

different condition has to be described, for a cancer has the peculiar property of freely infiltrating all the tissues upon which it presses, and when near the skin this becomes rapidly involved. As the tumour approaches the surface, the integument first appears to be drawn down to it, and afterwards as though glued to its surface. At a later stage the skin becomes infiltrated with cancerous elements, and to the finger feels firm, fibrous, or tuberculated, and when ulceration has commenced, the edges of the skin are palpably indurated, thickened, and infiltrated with cancerous products.

The contrast between these different conditions of integument in the two classes of tumours is most marked and very important, forming a most valuable means of diagnosis in the extreme stage of simple or malignant tumours.

*Simple or innocent tumours affect the patient solely through their local influence, and have no tendency to multiplication in other tissues, nor to involve the absorbents with which they are connected. Cancerous tumours not only affect the patient through their local influence, but have a marvellous tendency to multiplication in any part of the body, more particularly in the internal parts, and never exist for any period without implicating the lymphatics of the part with which they are connected.*

This difference between the two classes of cases is most important, and forms a very valuable means of diagnosis even in an early condition of disease; for in a case of tumour, the nature of which is doubtful from both its local and general conditions, the presence or absence of an indurated absorbent gland (not an inflamed one) will weigh down the balance of doubt, and tend more strongly than anything else to solve the problem; for it is as rare to meet with indurated glands in a simple tumour, as it is rare to miss them in a cancerous.

With these few preliminary remarks respecting the development of tumours generally, I will now pass on to consider the different varieties, treating of them in classes.

## CHAPTER II.

### ON THE SEBACEOUS OR STEATOMATOUS AND EPIDERMAL TUMOURS.

#### SECTION I.

THESE sebaceous or epidermal cutaneous cysts are doubtless the glandular or adenoid tumours of the integument. They are found only in these parts, and are composed of the peculiar elements of skin structure, containing the secretion of the skin itself, the sebaceous matter, and in some instances even the growth of higher development, viz., hair. They may spring up in any part of the body which is covered with integument—may occur at any age and in any sex, although it appears as if women were the more liable, forty-three out of the sixty-seven cases of which I have notes belonging to this sex. In a measure they are certainly hereditary, and have a strong tendency to multiplicity, but only as cutaneous tumours.

I possess the records of sixty-seven examples, and the following is a brief analysis of their histories :

In 43 of the 67 cases, the tumours were in women.

54 cases, the growth was upon the head or neck.

6	"	"	on the arm or hand.
1	"	"	upon the hip.
3	"	"	on the labium.
1	"	"	behind the anus.
1	"	"	upon the sternum.
1	"	"	at the umbilicus.

In all of these the tumour was treated by excision with complete success, and in no single example did erysipelas, or any other evil result follow from such a practice.

#### *Formation of the Sebaceous Tumour.*

These tumours are probably in a large proportion of cases formed by an obstructed follicle, for in some exceptional examples the contents may be squeezed out through the visible orifice and the cyst emptied ; such instances are, however, of rare occurrence, and it would rather appear as if a certain num-

ber of cases are really new formations. In some instances the tumour, although beneath the integument, has no connection with it, and is without doubt an independent cyst; and in the congenital sebaceous tumours there can be no doubt as to this being their origin, for these are quite independent, and what is more, almost always contain hair.

### *Fungating Follicular Tumour.*

In neglected examples of this disease, the contents of the tumour may soften down, and, causing suppuration, escape externally by ulceration; from the inner surface of these evacuated cysts a new growth may spring up, which is of a peculiar nature, and this forming an irregular, fungating, bleeding surface, at times puts on an appearance which has been mistaken for cancer. On examining the edges of the wound, however, this mistake can hardly be long entertained, for it will be at once observed that the edges of the wound are healthy, and not infiltrated with new matter, as would be the case in a cancer; and it is thus tolerably clear that this irregular fungating growth only consists of exuberant granulations from the cyst itself. An excellent account by Mr. Cock of this peculiar follicular tumour will be found in the 'Guy's Reports' for 1852.

*The diagnosis.*—From what has been already stated it will be gathered that there is not much difficulty in the diagnosis of a sebaceous tumour. Being a purely cutaneous development, its features are peculiarly exposed to observation; and when originating in an obstructed follicle, the true nature of the disease becomes most apparent, for the tumour is situated in the integument, and the closed orifice of the duct may be detected. It is only in exceptional cases, however, that the orifice of this obstructed follicle will be observed; but in a larger proportion of cases, on making an attempt to separate or raise the skin from the tumour, a dimple or evident connection between the two will become apparent, thus revealing its true cutaneous origin and pointing out its pathology. In other cases, however, no such obstructed duct, or even cutaneous depression will be observed; and although the tumour may be developed within the integument, another ex-

planation of its origin must be looked for. That this cyst is, under most circumstances, of independent growth, hardly admits of a doubt, and the truth of this opinion is strongly supported by the development of the congenital form of the disease, for these congenital cysts have the peculiarity of being more deeply situated than the other forms, such growths generally lying beneath the deep fascia, and sometimes beneath the muscles, this latter position generally being maintained when the cyst is placed in the neighbourhood of the eye—a very common seat. These congenital cysts also almost always contain hair, either in a mass, or as fine hairs, like the eyelashes. Such cysts, so placed beneath the muscles, cannot therefore be formed by the retained secretion from an obstructed duct, and it is not therefore difficult to understand how the same tumour may be formed at a later period of life. These tumours are also always globular, being evidently cystic. Their manipular indications vary considerably, differing according to their contents, being tense and firm in some cases, and pulpy in others; and in some they are so doughy as to be capable of being altered in shape by external pressure.

*Treatment.*—The only correct treatment of these cysts, whether whole or broken, is their removal by excision. It is needless to be too careful in dissecting the cyst out entire, as was formerly done, the most expeditious method being to slit open the tumour with a bistoury, and turn it out with the forceps or handle of a knife. This plan is rapid and effective, and far superior to the older and unnecessary one of a steady dissection.

In children, however, they may frequently be squeezed out of their bed by the thumb and finger. In an interesting case which came under my care in 1855, this disease and this plan of treatment was well shown: a female child, only five months old, was brought to me with its head studded with these tumours, varying in size from a pea to a large nut, and some of them were suppurating; many were squeezed out and others excised, recovery following.

The fear of erysipelas after these excisions appears groundless, as I have already shown that no such complication appeared in any one instance; and on a former occasion I

also showed that after scalp wounds erysipelas was equally rare.

## SECTION II.

### ON FATTY TUMOURS.

Wherever fat exists naturally in the body a fatty tumour may be formed, and as this material is more especially deposited in the integument, it is in and beneath this that fatty tumours are the most frequently found. They occur at all periods of life, from infancy to old age, and are even congenital; they attack the male sex as well as the female, but are by far the most common in the latter, sixty-three cases out of eighty-five being found in women. They are generally single, but in many cases two or more exist; some rare cases being recorded in which the whole body was studded with them—one of which I have seen. As a rule, they are found connected with and beneath the skin—rare examples occurring in which they are seen separating the muscles.

I have the notes of eighty-five examples of fatty tumours.

24 of these were situated over the deltoid muscle.

6	"	"	"	clavicle.
8	"	"	"	scapula.
7	"	"	"	arm, or forearm.
15	"	"	"	thigh.
17	"	"	"	trunk.
8	"	"	"	neck.

As already stated, sixty-three of these cases were in women and twenty-two only in men.

It is impossible to assign any true cause for their development; and, though patients often attribute them to a blow, there is no good evidence of such being a sufficient cause, and therefore no reason for such an assumption.

These tumours are generally troublesome only from their position and the deformity they occasion; at times they appear also to cause much pain: but such a symptom, I imagine, must be looked upon as an accident of their position.

Their excision is the only correct treatment. It was carried out in nearly every case which I have recorded, and death

followed in only one instance, the details of which are as follows :—

**CASE.—Excision of a Fatty Tumour—Death.** — A pale, but otherwise healthy looking woman, æt. 50, was admitted under my care into Guy's Hospital in December, 1859, with a large fatty tumour the size of a child's head, over the right scapula. It had been growing for thirty-five years, and, as it had been causing her considerable pain for many months, and from its size was troublesome, she came up from the country to have it excised. The operation was performed, under the influence of chloroform, without difficulty, and very little blood was lost, but the patient never rallied completely, and sank exhausted on the sixth day.

After death the viscera were found to be surrounded with fat, but healthy, with the exception of the kidneys, which were small and granular. The urine, however, was not albuminous.

The death of this patient made a great impression on me, and I ascribed it more to the influence of chloroform than the operation.

### *The Shifting of Fatty Tumours.*

The fact that fatty tumours shift their position is now generally recognised, and as this feature is peculiar to growths of this nature, it is a point of value in the diagnosis of difficult cases.

I have seen two good examples of this kind; one in a man, aged thirty-nine, who had been the subject of a fatty tumour in the neck for four years, and was admitted into Guy's, under the care of Mr. Birkett. The tumour, when it first appeared, grew from behind the ear, and gradually shifted downwards on the neck, till it lodged over the thyroid body, where it was seen on his admission, being then the size of a good fist.

The second case was in a middle-aged man, who had been the subject of a tumour for years; when first observed it was growing over the hip-bone, and as years passed on, it shifted down to the middle of the outer side of the thigh.



*Multiple Fatty Tumours.*

It has been already stated that fatty tumours, although as a rule single, in rare cases are more numerous, and the following is a good example of such an occurrence.

**CASE.**—A woman, æt. 34, was admitted into Guy's under the care of Mr. Cock on September 10, 1859. She had been the subject of tumours over her body for six years, but for the last eleven months they had multiplied rapidly. When admitted, the whole body—both trunk and extremities—was studded with such growths, all being of different sizes.

*Deep-seated Fatty Tumour.*

I have seen but one good example of fatty tumour beneath the muscles, and that was in a boy aged nine years. The tumour had been growing about six years, and was situated in the posterior portion of the thigh, beneath the flexor muscles. It was excised by Mr. Cock with complete success.

**Diagnosis.**—The diagnosis of a fatty tumour as a rule is not a task of difficulty; the majority of cases, being situated in the integument, presenting symptoms which may be regarded as characteristic.

With rare exceptions these tumours are lobulated and encysted, that is, are defined by a distinct boundary, their cyst wall being formed by the condensed fibro-cellular tissue in which they are developed. Being developed in the cellular tissue beneath the skin, the integument is necessarily more or less involved, and it will not, therefore, roll over the tumour with freedom and facility. To the hand of the examiner the tumour will feel more or less firm, and probably made up of lobes; and to the eye the skin will, on pinching up the tumour from its base, appear dimpled, and in parts drawn inwards towards the new growth—this last appearance being very characteristic of a fatty tumour, and when once observed almost sufficient in itself to settle the diagnosis.

*Diffused Fatty Tumours or Outgrowths.*

The appearances just given are found in the ordinary lobulated and encysted fatty tumour, as well as in the more rare and curious forms first described by Sir B. Brodie as the fatty outgrowths; but in these latter there is no distinct outline, and no boundary, "and you cannot say where the natural adipose structure ends and the morbid begins." These cases are not, however, at all common. I have seen one example in the male adult, aged forty-one, in whom the outgrowth was in the neck, and of four years' growth, the tumour appearing as one great fold of fat and integument around the nape of the neck, or beneath the jaw. The subject of it was a patient of Mr. Cock's. I have observed several others in young children, some of a very extensive kind. Their diagnosis is not, however, difficult, their external appearances being the same as in the encysted variety, and presenting an equally dimpled surface. Their treatment also is the same, excision being the only available plan. It has never fallen to my lot to witness any decrease in a fatty tumour by the internal use of alkaline or any other medicine.

A male child, *æt.* 2, was admitted into Guy's under the care of Mr. Cock, in August, 1855, with a diffused fatty tumour over the right major trochanter of the thigh; it had no boundary, but gradually disappeared in the tissues. Mr. Cock cut down upon it, and excised a large portion of the growth, which was composed of small lobules of fat in cellular tissue, and the wound healed kindly.

In the same year a like case occurred in the practice of the same surgeon, in a boy aged five years. The diffused growth was spread over the occipital protuberance, and was three years coming. It was also excised, and was made up of the same material as the last. Convalescence followed.

In 1857, a male child, *æt.* 6 weeks, came under my care with a diffused congenital fatty tumour around the right elbow joint, increasing with his growth; and at the present time I have another similar case under my care, in a male child one year and a half old; the tumour occupying the left axilla and side of the chest.

## CHAPTER III.

## SECTION I.

## ON CERTAIN FORMS OF CYSTIC TUMOURS.

IN the following chapter I propose to make a few observations on certain forms of cystic tumours, confining my remarks to such examples of the disease as possess fluid for their contents. Pathologically speaking, this division may be incorrect and unscientific, for the sebaceous or fatty tumours are also cystic, as are many other forms of tumour of the breast, testicle, &c.; but practically this division is of some convenience. I do not hesitate, therefore, to adopt it on the present occasion.

The majority of these cases are simple cysts, and are made up of a cell-wall and its fluid contents, this fluid varying much in its nature; in some being simply serous, more or less stained with blood, in others of a more tenacious nature, and of the character of mucus, or like the white of egg; in others, again, the fluid of the cyst may contain cholesterine, or altered blood, or some other material; and lastly, the cyst may be an hydatid in one of its forms.

*Mucous Cysts of the Mouth.*

At the mucous orifices of the mouth and vagina cysts are by no means uncommon. They appear upon the lips or inner margin of the mucous membrane as tense globular tumours, and are now generally believed by pathologists to be formed by an obstructed mucous follicle. They evidently contain inspissated mucus, and are readily treated by a simple incision into their interior, and evacuation of their contents; means being subsequently adopted to excite inflammation of their walls, and eventual destruction, by either plugging the cyst cavities with lint, or by applying to their surface some caustic or escharotic, as the nitrate of silver, chloride of zinc, or nitric acid. The simple plan of plugging with lint, however, is very effectual. In some cases the cyst may be excised, and when this can be done it is the most cer-

tain plan of treatment, but it is not always practicable. I have treated several examples of this disease of the lips by simply plugging the cyst with uniform success; and in other instances I have excised the cyst, but the former treatment is, as a rule, the best.

*Mucous Cysts of the Vagina.*

Cystic formations, precisely analogous to those just described, are found also at the orifice of or within the vagina, and at times these grow to a large size. I have seen one as large as a good fist, of four years' growth; a second, of equal dimensions, in a woman aged thirty-nine, in whom it had existed for twelve years; a third case, of nearly equal size, of ten years' growth, in a woman aged thirty-two; and a fourth instance in which both labia were similarly affected. In all of these the diagnosis was tolerably easy; the cysts were more or less globular, from fluid distension, fluctuating and tense. In all of these examples extirpation was carried out, and with success.

In other cases, however, in which the cyst is of smaller dimensions, it is hardly necessary to extirpate the growth, its simple incision and plugging with lint being all that is necessary. I have successfully treated many cases by this plan, and, unless the cyst be large, would recommend its usual adoption.

The contents of these vaginal mucous cysts vary considerably; in one of the cases quoted the fluid was of a coffee-ground nature; in a second, it was milky; in a third, it was of the consistence of mucus; and in one instance I have lately treated, the fluid was black, thick, and tenacious; in the majority of cases, however, it is either serous or of the nature of mucus.

It would be inconsistent with my design to dwell upon the other forms of mucous cysts, and more particularly the sublingual, usually described as ranula, for I have already, on a former occasion, treated of its pathology as well as of its treatment, and refer to it here simply as another form of mucous or cystic tumour.

*On Bursæ and Synovial Cysts.*

The enlargement of the natural bursæ by effusion into their interior, or the formation of an artificial bursa exactly corresponding in its character with a normal one by the effusion of fluid into the condensed areolar tissue of a part, are other varieties of cystic tumours which demand a passing notice. The natural bursæ exist usually over joints, and those over the patella and its ligament and the olecranon process are the most commonly enlarged. The artificial may be formed at any spot which is subjected to constant or prolonged pressure, and is evidently an attempt of nature to neutralise the results of a force which might prove injurious to the tissue by its continuance; the bursa of a bunion being the most common example. These enlarged bursæ, therefore, form tumours which are more or less globular in shape and more or less solid in their nature, varying from thin cysts to an almost solid and apparently fibrous tumour. But these indurated cysts always have a centre in which fluid exists, thus proving their nature and origin. Their contents vary from a thin serum to an almost pure blood; fibrine in different degrees of quantity occurring in most.

*Diagnosis.*—There can be little difficulty in the diagnosis of a natural bursa, or even of the artificial, if the surgeon bears always in mind the fact that they do occur in certain positions, and may occur at any spot subjected to constant or prolonged pressure.

As already stated, they are, as a rule, globular; but to this there are many exceptions found in practice. They are generally also to the touch more or less fluctuating, some of the cysts being quite thin and baggy, whilst others may be tense or firm, so as to feel of a fibrous nature; and a third class may, as already mentioned, put on the appearances and manipular indications of a solid tumour. An error in diagnosis, however, can rarely take place if average caution be employed in the attempt.

*Treatment.*—In the early stages of a chronic enlargement of a bursa the application of a blister is the best practice; and this may be repeated if the effusion has not been reabsorbed.

Iodine, as an external application, appears perfectly useless, and I always regard its employment as waste of time. Should the blistering treatment fail to effect a cure, the introduction of a seton is to be recommended; the seton being left in to excite inflammation and suppuration of the cyst-walls. Should suppuration be profuse, the bursa must be opened; but this practice is seldom called for. When the bursa has indurated and put on the appearance of a solid tumour, its excision is the only correct practice. The changes which take place in a bursa to produce a cystic tumour are of a chronic nature, and are also inflammatory. When acute inflammation attacks a bursa, a very different train of symptoms, with external and manipular indications, would have to be recorded if it were consistent with my design to enter upon the point; but it will suffice, if I add, on the present occasion, that it is to an acute inflammation of one of the superficial bursæ that nearly, if not all cases of suppuration about an articulation are to be attributed; the inflammation and suppuration originating in one of the natural bursæ, and spreading laterally to the cellular tissue, in some cases thus involving the whole cellular tissue external to an articulation.

*On the Ganglionic Tumour.*

Cysts or ganglia are very frequently formed about the sheaths of the tendons, although their true pathological nature may be somewhat difficult to determine. They appear, says Paget, "to be the cystic transformation of the cells inclosed in the fringe-like processes of the synovial membrane of the sheaths," and the results of dissection appear to justify this opinion. They are most frequently found about the wrist-joint, but may form in any part in which a tendon exists. They show themselves generally in unilocular or multilocular cysts in the course of the tendon, and may be tense or flaccid, according to the nature of their contents or the amount of distension, and are more or less fixed, according to circumstances. They may involve a single tendon or many; and in one case now under my care every carpal tendon is the seat of the disease.

*Treatment.*—In the treatment of ganglionic tumours, considerable difficulty is often experienced. They may be dispersed by various means, but the tendency these cystic tumours have to return is so great, that in some instances, in spite of all care, they will reappear.

If the ganglion can be ruptured, such treatment should be carried out, and the best method appears to be by pressure, the hands of the surgeon grasping the wrist, and the thumbs superimposed firmly pressing on the ganglion, previously made tense by the extension of the tendon.

The application of a blister over the part after rupture appears to expedite the cure, although I have rarely seen any good from its use without such treatment.

If these means fail, the passage of a seton through the growth is the best plan to adopt; but this practice is attended with some risk, and should not, therefore, be carried out unless a necessity exists; the hand or extremity should, at the same time, be kept at absolute rest, to check and control inflammatory action. Should acute suppuration follow this practice, an incision into the tumour should not be neglected, for the matter is liable to extend up the sheaths of the tendons, and this should therefore be carefully guarded against.

I have treated many cases by this plan, and have never seen any evil follow; but as surgeons still record their fears of an evil result, it is as well to bear the fact in mind. In rare cases, in which complete consolidation has taken place, excision must be performed, extreme care being taken in the dissection that the tendon be left uninjured, and that perfect repose of the part be subsequently maintained during its repair. Cases requiring such treatment are, however, few and far between.

I have seen a ganglion upon the flexor tendon of the index finger of an infant eight months old, and on the flexor carpi radialis tendon of a child four years of age; but they may be seen at all ages.

## SECTION II.

### ON CYSTS OF THE NECK.

Cystic tumours of the neck may occur as independent formations, or in connection with the thyroid body. When

developed as independent tumours they are usually, although not invariably, single, possess thin walls, and may grow to a large size. They may appear as superficial cysts, being simply covered by skin and fascia, or, what is more common, they may possess deep attachments, apparently in some cases passing downwards beneath the muscles to the spine itself.

They are seen at all ages, and are even congenital. My colleague, Mr. Birkett, in the Guy's 'Reports' for 1860, has given an admirable description of these tumours, and has entered minutely into their pathology. He there gives an example of such a congenital formation.

*CASE.—Congenital Cyst in the Neck.*—A similar example came under my care in September, 1861, in a female, E. C—, æt. 16, who was born with a tumour above the right clavicle, passing up from beneath the sterno-mastoid muscle. It was described to me by the mother as soft, and like a bag of water, and after a few months, emptied itself completely, a cupful of a clear fluid passing away. The wound soon, however, healed, and the cyst again enlarged, but slowly, and without pain, for it was not till the child was five years of age that it was tapped by a surgeon; fluid of the same character was again drawn off, and with a like result, for when eleven years of age the cyst had refilled, and was again tapped. When I first saw her another five years had passed away, and it was evident that a cyst existed, passing forwards from behind the sternocleido-mastoid muscle above the left clavicle. I tapped it, and drew off two ounces of a clear, highly albuminous fluid, and through the canula passed a seton through the cyst wall; some inflammation and suppuration followed, and the cyst contracted, the patient, when last examined, three months subsequently, being apparently well.

In this interesting case the cyst was evidently congenital; it grew slowly, and its development was unattended by pain, a practical point which is generally to be observed in the growth of such formations.

*Treatment.*—In the treatment of these cystic tumours, or, as they have been called, hydroceles of the neck, there is now



little difference between surgeons as to the soundest practice to be pursued, this consisting in leaving them alone, unless there are strong and powerful reasons for interference. If the cyst be small and superficial, there can be no objection to a more active treatment, for the chief danger of interference lies in the fear of an acute inflammation spreading from a deep-seated cyst to the cellular tissue of the neck, and as a large proportion of these cysts are developed beneath the muscles, this danger is very real ; as a practical deduction it may, therefore, be asserted, with some confidence, that in deep-seated cystic tumours of the neck the best thing is to leave them alone.

Should, however, some interference be imperatively demanded, either from the size of the tumour or from the pain and symptoms with which it is attended ; the puncturing of the cyst with a trocar and canula, and the evacuation of the fluid, is the soundest practice, this operation being repeated as occasion may demand. This proceeding is not altogether free from danger, for many cases are recorded in which a fatal effect was the result, and an instance occurred in my own practice, six years ago, illustrating the fact.

*CASE.—Cyst in the neck ; tapping, with a fatal result.—*A woman, æt. 40, applied to me, at Guy's Hospital, with a cystic tumour of the neck, on the right side. It was not, apparently, deep-seated, but as it caused her considerable annoyance and some pain, I was induced to tap the cyst, drawing off about one ounce of a blood-stained fluid. The woman returned home, and I heard nothing more of her for some days, when a friend of her's called to tell me of her death, which took place four days after the operation, the inflammation spreading from the cyst to the neck generally, and destroying her by suffocation. I tried to procure particulars of the case from the medical man who was called in, but could not succeed. This case caused me considerable vexation at the time, and was valuable as an illustration of the evil effect which will sometimes follow such an apparently innocent operation as the simple tapping of a cyst of the neck.

In the example of congenital cyst already quoted, the benefits of the introduction of a seton are favorably shown ; but it must

not be supposed that this good result can always be secured, for the danger of acute inflammation of the cyst and the neighbouring cellular tissue, is as great after this operation as after the former, and the greatest care should be employed in carrying it out. The operation of incision into the cyst, and its extirpation, is also equally hazardous, and should be done only in cases in which the cyst is small, and then only when imperatively demanded. Injections of iodine, as a primary treatment, are also to be dreaded, and should therefore be employed in only exceptional cases.

What, then, should be the treatment of these interesting cases? and what are the means to be adopted by which a permanent cure may be ensured?

I have already stated that the simple puncturing of the cyst is the soundest practice to be followed when a necessity for interference positively exists; and I have also advised that this operation should be repeated as soon as a re-collection of the fluid has taken place. As a rule, after several tapplings of the cyst, the nature of the fluid becomes altered, and the cyst wall materially contracts; and when these changes have taken place, the opening may be permanently established by the introduction of a perforated india-rubber tube, or drainage tube as it has been called. By these means the cyst will gradually collapse and contract, and a cure result. Mr. Birkett, in his valuable paper already alluded to, has given some interesting cases illustrating this point, and having had the opportunity of observing several of the examples, I can with confidence recommend the treatment.

The following case of congenital cystic tumour of the neck will also be read with interest. It occurred in the practice of Mr. Cock.

*CASE.—Congenital cyst in the neck; tapping; recovery.*—A female child, æt. 9 months, was admitted into Guy's Hospital in July, 1856, with a congenital cystic tumour above the left clavicle, of very large size, and requiring relief. The cyst was punctured, and several ounces of serum stained with blood drawn off. On the fifth day the child was taken home, the tumour having nearly disappeared. In a few days, however, the cyst inflamed, and the child was re-admitted, when a free

opening was made into the tumour, and a quantity of pus escaped; from this time everything went on well, and the child left the hospital convalescing.

The following example also of hydrocele of the neck is worthy of record on account of its extreme size; it occurred in the practice of Mr. Poland.

**CASE.**—*Very large cyst in the neck.*—A boy, æt. 13, was admitted into Guy's in July, 1857, with a large cyst on the right side of the neck, evidently unconnected with the thyroid gland; it was tapped, and a pint of thin serous fluid drawn off, giving much relief, after which the boy left, and no further record exists.

### SECTION III.

#### ON CYSTS IN THE THYROID GLAND.

These cysts are unquestionably more common than the variety we have just described, and they differ from the last also in the fact that they are generally multiple, although it is usual for one cyst to be larger than the others, and, as a consequence, to be the source of special observation.

They are diagnosed without much difficulty, for when the patient swallows fluid or saliva, the cyst moves upwards with the larynx, and when this occurs, the surgeon may with confidence conclude that the tumour is in the thyroid. It should be added, that the other forms of hydrocele of the neck which I have described, are never influenced by deglutition; consequently this distinction between the two varieties becomes valuable for diagnosis.

These thyroid cysts vary much in size, and acquire, in rare instances, very large dimensions; specimens existing in the Guy's museum several inches in diameter, three or four being by no means uncommon.

The cyst contents also vary extremely, being in one case serous, and more or less blood-stained; in others of a tenacious and gummy nature, while, in rare examples, the cyst contains almost pure blood. At this present moment I have under care an interesting example of this disease illustrating this fact, and the following is an outline of the case:

*CASE.—Blood Cyst of the Thyroid.*—A woman, æt. 26, came to me, on April 6th, 1863, with a large cyst, the size of a coconut, on the right side of the thyroid gland. It had been growing three years, and at times had increased more rapidly than at others. For some weeks the tumour, from its size, had interfered both with deglutition and respiration, and had thus called for some operative relief. The woman was, unfortunately, seven months gone with her third child, rendering any operation somewhat dangerous. On April 7th I tapped the cyst, and drew off twelve ounces of almost pure blood, the fluid coagulating freely after it had escaped; this flow of blood would apparently have gone on to the exhaustion of the patient had I not removed the canula. On doing this, the flow ceased, but the size of the tumour was rapidly restored. Nothing more could consequently be done; the woman went home to be confined, and I have lately heard all passed off well. She is coming up again for further treatment.

*Treatment.*—The excision of these cysts is a practice which cannot be recommended, for it is an operation of considerable danger as well as difficulty, and needs, therefore, no further consideration. Other means are open, however, to procure the obliteration of the cyst, and many have been tried. The cyst may be freely incised and plugged with lint, as practised in other cases to which we have already alluded; but the results of this practice are not encouraging, and its dangers are also too great to warrant its recommendation for general adoption. The introduction of a seton through the tumour is another method which has been followed, but it is one with which I am little familiar, and I must confess to having fears of such a practice being too dangerous. The best plan to effect a cure I believe to be by tapping, and the subsequent injection of the cyst with iodine; but this treatment is only applicable to the smaller cysts, as, in the larger kinds the danger of exciting acute inflammation in the cyst walls is too great to warrant the general adoption of such a method. In these severe cases I should prefer the plan of treatment recommended and described in the hydroceles of the neck, namely, repeated tappings of the cyst, and the subsequent introduction of the drainage tube. By this practice the cyst will gradually contract, and a cure may be looked for with some confidence.

I may again refer, with pleasure, to Mr. Birkett's paper in the Guy's 'Reports' for 1861, for a good exposition of this subject.

*CASE.—Cyst in the thyroid; tapping; recovery.*—Two cases illustrating the successful treatment by iodine injection have passed under my notice. One occurred in the practice of the late Mr. Aston Key, and I was the dresser to the case. It was in a female, æt. 12, who had a cyst situated in the isthmus of the thyroid gland, about one inch in its largest diameter. The contents were removed by tapping, and iodine injected. A cure resulted.

*CASE.—Cyst in the thyroid; injection with iodine; recovery.*—The second case occurred in my own practice in May, 1860. It was in a healthy woman, æt. 27, who had a cyst developed in the right side of the thyroid gland, of six years' growth. It was about the size of a small orange, and quite globular, having increased somewhat rapidly for the last two months. It had not caused her any inconvenience until quite recently, when it had rather interfered with her power of deglutition. The cyst was punctured with a trocar and canula, and rather more than an ounce of thin serous fluid, of the palest yellow tint, and slightly tinged with blood, escaped. In June the cyst had refilled. It was again punctured, the same kind and amount of serum were abstracted, and one drachm of the compound tincture of iodine was injected through the canula. Some inflammation of the cyst was excited, sufficient to consolidate it. The induration was subsequently absorbed, and the disease cured in about two months.

The results of this plan of treatment in the case quoted is encouraging, for it is both useful and successful. From one to two drachms of the compound tincture of iodine is the right form for injection.

---

## CHAPTER IV.

### ON HYDATID TUMOURS.

ONE of the most interesting subjects of speculation connected with the development of tumours is involved in considering the growth of the hydatid. For no good explanation

has yet been given either of their origin or of the mode by which those entozoa gain an entrance into the tissues of the body, although the investigations of Siebold and others have thrown some light upon these points. That they do gain admission from without is now no longer a subject of doubt; and the largest proportion of the hydatid cysts found in the body are connected with the abdominal or pelvic viscera. A few cases occasionally occur in practice, in which the integumental or intermuscular tissue is the seat of the disease, but these cases probably form only a third part of the examples of hydatid tumours.

As surgeons we are called upon to treat all these forms of hydatid tumours, but it is the last variety alone which demands our attention on the present occasion. Cystic tumours made up of hydatids may be of any dimensions, and some grow to a very large size; they may occur at all ages and in any part of the body, and are known by their gradual growth, painless character, and peculiar hard, stony, and globular form, their shape, however, being materially modified by the position in which they are placed, and being unconnected with any tissue, they simply separate parts in their growth by a gradual expansion. If formed beneath the integument only, they assume the globular shape, and roll beneath the finger like a marble, being when small remarkably hard from the tension of the cyst. If situated beneath the superficial tissues and between the muscles, they are very resisting, are quite as tense as those last described, and cause pain only when pressing upon any of the nerve trunks. They are of inconvenience, therefore, simply from their position, and require treatment on account of the mechanical inconveniences they cause.

The difficulty of diagnosing with anything like accuracy the presence of one of these cysts is, nevertheless, very great. When a subcutaneous tumour exists, however, evidently free from all adhesion to the integument, and lying beneath the skin as a smooth globular tense tumour, like a foreign body, without any connections, the suspicion of its being an hydatid should be entertained; for I have already shown how the more common cutaneous tumours, such as the sebaceous and fatty, are always more or less adherent to the skin itself. The hydatid tumour is, therefore, marked more by the absence of such symptoms

as belong to the more common tumours than by the presence of special local characteristics peculiar to itself.

These tumours have no cyst walls, they are simply cysts lying in the cellular tissue of a part, which becomes more or less condensed according to the amount of pressure it has sustained and the time the parent cyst has existed in the part. They are, therefore, readily removed; a simple incision through the parts covering them in, allowing of their escape, and, as they never form any adhesions with the neighbouring tumours, no dissection is required. When suppuration exists it occurs in the cellular tissue around the cyst and not in the cyst itself; and only when this entozoon loses its life, this being one of the means adopted by nature to get rid of a foreign body which, by its death, is a source of irritation. I possess the records of some interesting cases of this form of tumour; the following notices of which may be read with advantage.

The first case is one which has been already recorded by my colleague, Mr. Birkett.

*CASE.—Hydatid beneath the integument on the thorax.*—A healthy woman, æt. 23, was admitted into Guy's Hospital, under Mr. Birkett's care, in November, 1853, with a small, indurated, globular, fluctuating swelling beneath the skin, situated below the left clavicle. It was quite free from all adhesion, and could be rolled, with ease, beneath the integument. It had been detected six months. When left alone it was quite painless, but, on pressure, a sharp lancinating pain was produced, which shot up to the shoulder.

A single incision was made over the centre of the tumour and the cyst removed, with the condensed cellular tissue and fat in which it had been developed. The cyst was made up of a single globular entozoon, known as the *Cysticercus cellulosus*. The wound rapidly healed.

*CASE.—Hydatid in the tongue.*—The second case occurred in the practice of Mr. Cock, in March, 1853; it was also in a woman, æt. 36. The cyst was situated in the left side of the tongue. It appeared as a tense, stony, and projecting tumour. It was removed by a simple incision, and proved to be a single cyst. Recovery followed rapidly.

CASE.—*Hydatid in the thigh, beneath the flexor muscles.*—A woman, æt. 24, was admitted into Guy's, in November, 1858, under the care of Mr. Cock, with a tumour beneath the flexor muscles of the left thigh, of two years' growth. The tumour was hard and tense, the integument over it being uninvolved. The patient was also free from pain. A single incision was made over its most prominent point, and on the deep fascia being divided a perfect hydatid cyst turned out, together with several smaller ones. The wound healed kindly.

CASE.—*Hydatid tumour over left gluteus muscle.*—A woman, æt. 22, was admitted under the care of Mr. Cock, in April, 1856. Two years previously she first detected a small lump, like a marble, beneath the integument on the left buttock; it was quite painless and moveable, and she sought advice simply on account of its growth, which had been very gradual. On the tumour being tapped, five ounces of a thin, and milky fluid were drawn off; but as it rapidly refilled, a free incision was made into it on the fifth day, and many hydatid cysts escaped. Recovery was complete.

CASE.—*Hydatid tumour on the left buttock.*—A man, æt. 37, was admitted into Guy's in January, 1859, under the care of Mr. Cock, with a tumour on the left buttock. It had been gradually growing for thirteen years, was painless, hard, and globular, the size of a fist, and situated beneath the integument, which was uninvolved. An incision was made into it, and an hydatid cyst removed; recovery following.

There was another example, also, of hydatid tumour on the same part, treated in the same way.

CASE.—*Hydatid tumour between adductor muscles of thigh.*—A man, æt. 36, was admitted into Guy's Hospital, under my care, in June, 1862, with a large tumour beneath the adductor muscles of the left thigh. He had observed it for only five months, and its growth had been gradual; it was firm, tense, and semi-fluctuating, and the integument over it was quite free. The man's health was very good, and the thigh free from pain. I explored the tumour with a trocar and canula, and drew off some milky semi-purulent fluid, and,



upon increasing the incision, nearly a pint of fluid with hydatid cysts escaped. The wound healed very rapidly, and convalescence was established.

---

## CHAPTER V.

### ON THE FIBRO-CELLULAR, FIBRO-PLASTIC, AND FIBROUS TUMOURS.

IN surgical language it does not appear to be an unscientific nor incorrect arrangement to place the fibro-cellular, fibro-plastic, and fibrous tumours in one group, for pathological investigations lead us to believe that these are all modifications of the same thing, being composed of fibre tissue in one or other of the forms of its normal development. In the *fibro-cellular* tumour the fibre tissue is of a delicate nature, far from compact in its arrangement, containing within its meshes serum, or a clear fluid of a more tenacious character, and in some cases nucleated cells, and appears to be made up of rudimentary or embryonic fibres, such as naturally exist in the formation of the foetal fibre tissues. To the eye such a tumour appears soft and succulent, although it will be found strong and tough on making any attempt to tear it. In the *fibro-plastic* tumour the same elements exist as have been described in the last variety. Fibre tissues form the principal basis of its structure, but this fibre tissue is of a more perfect and developed kind, the fibres being stronger in their individual nature, and their filaments bound together in larger bundles; it is therefore firmer in its substance and less succulent; its fluid is also clear and translucent, and nucleated cells are found in different quantities within the meshes of the filaments, these nucleated cells being caudate and elongated, and in different stages of their development into fibrous tissue. This form of tumour is therefore more firm and solid than the fibro-cellular, but is less so than the next variety, to which attention will be drawn, viz., the fibrous.

The *fibrous* tumour is made up of fibre tissue, and unlike

the fibro-cellular tumour, which is composed of rudimentary or embryonic fibres, and the fibro-plastic, which is made up of fibre tissue in the process of development, the fibres consist entirely of well developed and perfected fibre tissue, few if any nucleated cells entering into its formation. It is therefore of a firm, solid, or so-called fibrous fleshy feel, and is in its nature so characteristic as to forbid an error in its diagnosis. Between these three different forms of fibrous or fibroid tumours there are practically found many varieties, some containing more fibre tissue and others more of the cell element. When this latter predominates, the "fibro-nucleated tumour" is said to exist, but this variety is evidently only one of those I have already described, yet, containing more of the cell element, it approaches more closely the nature of the cancerous tumour.

What are the conditions, it may be asked, which determine the development of one or other of these forms? and if it is impossible to give an adequate answer to such a question, it certainly does appear as if the position of the part in which the tumour is developed has a material effect in influencing this point. For the fibro-cellular, a soft and succulent tumour, is, as a rule, situated in such parts of the body as are naturally made up of loose and uncondensed cellular tissue, and in which serum naturally exists; the labia in the female, and the scrotum in the male, being its most frequent seat, and the subcutaneous tissue the true position for its development.

The fibro-plastic tumour may spring from any part, being generally, however, subcutaneous, and more frequently connected with fascia and the intermuscular cellular tissue; it appears, in short, more in those parts of the body in which the developed fibre tissue is naturally present. The most genuine fibrous tumour is found in the uterus, this part of the body containing more perfect and abundant fibre element than any other, but surgically the skin and periosteum are its most frequent seats, these parts containing also abundant fibre tissue. All these growths are, however, absolutely local; they affect the health of the patient simply from local causes, and never attack the body through the lymphatic system, the absorbent glands in no recorded cases having become involved. This point is a very valuable one, stamping these

fibroid tumours as essentially distinct from the cancerous or malignant.

### *Analysis of Cases.*

I possess the records of fifteen cases of the fibro-cellular tumour, and all were connected with the female genital organs, one or other of the labia and nymphæ being involved. In every example excision was performed, and with success. The cases are hardly of sufficient interest for quotation. They almost all appeared in young women, and were of slow growth, several being of twelve or fourteen years' existence. In no one instance was any pain present, the mechanical inconvenience connected with the tumour being the chief reason for its removal.

*Diagnosis.*—The fibro-cellular are purely cutaneous tumours, being situated, as already explained, in the cellular tissue of the skin, and formed by the unnatural growth of such a texture; they are intimately connected therefore with the integument, and to the hand appear as if the skin and its subcutaneous tissue were infiltrated with a more solid material. It is a kind of solid œdema of a part, yielding a fleshy feel, is in some cases more solid than in others, and in certain examples appears as a kind of polypoid growth. The polypi of the nose and of the neck of the uterus, and many of the tumours connected with the antrum, are made up of this fibro-cellular tissue, but these are of a peculiar succulent kind. The tumours of the integuments are more solid, but of the same nature. The pedunculated tumours of the skin are of the same description. In an example of this affection which I removed from a man aged twenty-six, the tumour was so full of serum that, when removed, it collapsed into a very small compass: it was pedunculated, and of congenital formation. The pedunculated or polypoid cutaneous fibro-cellular tumours are by no means uncommon; they grow at times to a large size, are as a rule perfectly painless, and prove of inconvenience simply from their dimensions; they may be readily removed, and in some cases a simple twist of their pedicle is enough to cause obstruction to their circulation, and the subsequent sloughing of the growth. I have removed many such

growths by these means in patients who have rejected the more surgical method, having accidentally hit upon the plan some years ago from seeing a tumour turn black during its manipulation for examination; one half turn of its pedicle, as a rule, suffices to secure this end, but if not, a more perfect twist may be made, the tumour being subsequently fixed in this position by strapping. In the Guy's Museum a large tumour may be seen, which I removed by this method.

The *diagnosis* of the fibro-plastic tumour is not always a subject of difficulty. It is found always as a distinct growth, and never as an infiltrating one, increases by a gradual process, separating the tissues between which it is situated, and is not generally painful, pain being, as it were, an accidental complication, depending upon the situation of the tumour relatively to the nerve trunks, and upon the fact of its being bound down and confined by any dense structure, as a fascia; in which cases the pain may be intense, and relief is only gained on the removal of the cause. These tumours have an irregular outline; they are not uniform in their shape, like the cystic tumours, but have a more botryoidal character, being more or less nodular; and when bound down by a fascia their external characters are necessarily lost. The tumour then feels firm and fleshy, but its diagnosis rests more under these circumstances on other points, such as the age of the patient, rapidity of the tumour's growth, and the presence or not of any secondary glandular affection.

These fibro-plastic tumours may grow at all ages, but as a rule they attack the young and middle aged: of the eighteen cases I possess, seventeen commenced in patients under the age of forty, the majority of cases beginning in subjects between twenty and thirty years of age.

3	were developing only a few months.
5	„ between 1 and 5 years.
4	„ „ 6 „ 10 „
6	„ over 10 years. Two of them growing 25 years.

They seem to be as common in the male as in the female sex, and no assigned causes for their appearance can generally be fixed upon. They turn out, as a rule, readily from their attachments, upon making a clean incision of the parts covering

them in; and recovery rapidly follows. In all the cases recorded a good result ensued.

The neck and the region of the parotid gland is a very frequent position in which these tumours are found; they sometimes grow superficially, but at others in the deeper structures; and, when growing in the parotid region, it is almost an impossibility to make out, with anything like accuracy, their true connections, an apparently superficial tumour having often very deep attachments; they are never accompanied with any secondary glandular enlargement.

### *The Diagnosis of the Fibrous Tumour.*

Fibrous tumours are seldom found as isolated growths, like the fibro-plastic; although, like them, they are commonly associated with those tissues into the composition of which the fibre element enters largely. The best examples are found in the uterus and prostate gland, but the cases which come under the notice of the surgeon as tumours the most frequently, are developed in the skin, or in the fascia and tendinous structures connected with bone.

I have the notes of ten examples of so-called fibrous tumours, seven of which were developed in the integument and three beneath it, near the bone, these three being connected with the hand. The fibrous tumours more intimately associated with the osseous system will be considered with the tumours of bone. There is not, usually, any difficulty in the diagnosis of these cases, for the tumours are hard and fibrous to the touch, and, as a rule, painless; they are also slow in their growth, and are unconnected with any secondary formations. Their excision is the general practice.

The following brief notes of some of the examples of fibro-plastic and fibrous tumours may be read with interest.

**CASE.**—*Fibro-plastic tumour over right parotid.*—Sarah P—, æt. 35, was admitted into Guy's, under my care, in March, 1863, with a tumour, the size of a small orange, over the right parotid, of a botryoidal outline. It was unconnected with the integument, painless, and appeared moveable; it had been growing for fifteen years. It was readily excised, and convalescence followed.

CASE.—*Fibro-plastic tumour over parotid.*—Mary S—, æt. 41, was admitted into Guy's Hospital, under the care of Mr. Birkett, in May, 1856, with a large, lobulated tumour, the size of a cocoa-nut, over the right parotid region, of twelve years' growth. It was unattended with much pain, or with any paralysis of the facial muscles. It was excised, and recovery followed.

CASE.—*Fibro-plastic tumour over left parotid region; paralysis of facial nerve.*—A man, æt. 52, was admitted, in November, 1856, into Guy's Hospital, under the care of Mr. Cock, with a tumour, the size of a fist, over the left parotid, of twenty-five years' growth, and with paralysis of the facial nerve of three months' standing. The tumour was excised and convalescence ensued, the paralysis of the facial nerve disappearing.

CASE.—*Fibro-plastic tumour in right parotid.*—A woman, æt. 29, was admitted into Guy's, under the care of Mr. Cock, with a tumour in the right parotid of eleven years' growth. It was excised, and the tumour turned out of its cyst, which reached deeply down to the vertebra, the carotid vessels lying in front of the tumour. A good result followed.

CASE.—*Large fibro-plastic tumour behind left shoulder; excision; recovery.*—A man, æt. 41, was admitted into Guy's, under my care, in April, 1863, with a large tumour, the size of half a cocoa-nut, projecting apparently from behind the deltoid muscle; it had been observed only seven months, although pain had been felt in the part many months previously, but when the tumour appeared externally the pain diminished. His axillary glands were not to be felt, but he had a large glandular tumour beneath the jaw, of ten years' growth. His health was good. The integument was uninvolved, and the tumour had a firm, fleshy feel, and somewhat irregular outline, several bosses projecting in different parts. The tumour was removed by making a vertical incision through the integument covering it in, and was then found to have been developed beneath the deltoid muscle; it turned out with some facility from its bed. Having removed the parent tumour, two sepa-

rate and distinct growths were then detected—one small, the size of a large marble, imbedded in the body of the deltoid muscle; and the second, about the size of a walnut, lying between the fibres of the *teres major*; these were readily removed, and a good recovery followed. No return has taken place up to this time. Microscopically, the growth was seen to be made up of the elements of the fibro-plastic tumour, the cell element largely predominating.

*Remarks.*—This case was one of unusual interest. First, as to its diagnosis—Was it connected with bone, or was it situated only beneath the muscles? The fact of extreme pain having long existed before the detection of the swelling led one to suspect its having an osseous origin, for this symptom is one of great value in the diagnosis of deep-seated tumours; new growths, associated with bone, being, as a rule, long preceded by a deep-seated pain. But in the case under consideration the tumour appeared moveable, and was certainly not influenced by the rotation of the humerus.

Was it a simple or a malignant tumour? was the next point demanding solution. The age of the patient, and the rapidity of its growth, pointed in a measure to its malignant nature; but the apparent good health of the man, and the absence of any secondary glandular enlargement, was in favour of its innocent character; and it must be remembered that this point is one of great value, for doubtless in acute cancers the secondary glandular enlargement is an early symptom. The skin, also, was uninvolved, and the tumour appeared isolated between the muscles—these facts pointing strongly in favour of its being of an innocent character, for cancer, it is well known, has a strong tendency to infiltrate parts, and not to separate them. Upon the whole, the facts present preponderated in favour of its being simple.

There is another point in the case which demands a notice, and that is the presence of two other independent tumours of a like nature within the muscles of the part. I know of no other case in which this fact is illustrated.

*CASE.*—*Fibro-plastic tumour in the calf of the right leg; amputation; pyæmia; death.*—A man, æt. 51, was admitted

into Guy's, on September 7th, 1857, with a large tumour, occupying the calf of the right leg, of one and a half year's growth. It had increased steadily, and was accompanied with some pain; it was tense, had a uniform outline, and evidently a deep attachment. The lymphatic glands of the limb were unaffected, but the man's health was not good, and he had a very cachectic aspect. An exploring trocar and canula were introduced, but with little result—a small piece of the tumour, however, came away within the canula; this I examined by the microscope, and found to contain the elements of the fibro-plastic tumour. Amputation was therefore performed, but the man died on the thirteenth day, from pyæmia.

The tumour had originated between the two layers of muscles, and had caused a complete wasting of the gastrocnemius, which was spread over it.

*CASE.—Congenital fibro-plastic tumour of the toe; amputation; recovery.*—Eliza T—, æt. 8, was admitted under my care, in October, 1863, with a congenital tumour, the size of a walnut, occupying the whole of the right little toe; it was painless, and had been growing slowly; it was excised, and found to be a good example of the fibro-plastic tumour, approaching more the fibrous nature.

This case is introduced here as a type of a class of congenital tumour which is not uncommon; I have seen and treated many such.

#### *On the Fibro-nucleated Tumour.*

I have the record of only one example of the fibro-nucleated tumour; it occurred in a female patient of Mr. Cock's, aged thirty, and was of three months' growth. When admitted into Guy's, in April, 1857, it was about the size of an orange, and was situated by the side of the umbilicus; it was evidently growing in the integument, and to the hand felt hard and fibrous; there was no secondary glandular enlargement, and the health was good. It was readily removed, and microscopically was composed of little else than simple nuclei, held together by fibre tissue.



This is the only example of this form of tumour I have had the opportunity of examining, such cases being evidently very rare. The fact of their being chiefly composed of cell element is one which undoubtedly links them to the malignant tumours, and this case will therefore lead us to consider another class of fibro-plastic tumour, which has been described by Mr. Paget as the recurring fibroid.

---

## CHAPTER VI.

### ON THE RECURRING FIBROID TUMOUR.

THE name given to this class of cases very accurately defines their pathological peculiarities. They possess all the characters of the fibro-plastic tumour we have just described; but they possess one of the features of the cancerous, in so far as they have a constant tendency to return, after removal, either in the same place or in the neighbouring parts, even to many times. In the pathological chain of tumours they are therefore unquestionably connecting links between the innocent and malignant growths. There is really nothing very distinctive in their external character by which they can be known. They are, perhaps, somewhat less dense than the ordinary fibro-plastic tumour, and are more rapid in their growth. Microscopically, they also possess more of the cell element than the innocent form, these cells taking on the caudate shape; but I know of no means by which a definite diagnosis can be made of such a growth. The more rapid the development of a fibro-plastic tumour, and the more cellular its structure, the greater appears to be the probability of its being of this nature.

The following are the brief records of some of the cases which I possess. Three of the best examples which can be brought forward have been already published by my colleague, Mr. Birkett, in the 'Guy's Reports' for 1855, in a very interesting paper upon this subject; but as they form part of the material upon which this communication is based, they must be re-quoted here, although in a condensed form.

**CASE.**—*Recurring fibroid tumour in the thigh; seventeen operations for removal during a period of ten years; death from phlebitis.*—A girl, æt. 16, was admitted, under the care of Mr. Cock, into Guy's Hospital, in August, 1847, with a small tumour in the anterior region of the right thigh, which she had observed for one year. It was just beneath the integument, and was soft, moveable, and very painful. Her health was not considered to be very good, although she looked hearty. In December, 1847, the tumour was excised; it was soft, succulent, and vascular, and the microscope showed it to be made up of delicate fibres of fusiform nucleated cells; the wound healed in one month.

Four months after this, in May, 1848, there appeared by the side of the cicatrix a return growth, which increased slowly, and was removed in October of the same year. It had the same appearance as the last, except that here and there were small cysts, filled with soft, jelly-like material.

In April, 1849, a *third* growth made its appearance, and was exquisitely painful. It was removed in October, 1849, together with a nerve which had a ganglionic enlargement in the old cicatrix.

In November, 1850, a fourth recurring tumour had appeared, of six months' growth, and on this occasion the fascia beneath was removed with it.

Other operations were performed in March, 1852, July, 1853, and repeated up to January, 1856, when she went into St. Bartholomew's Hospital, and died from phlebitis, after which Mr. Paget forwarded to Mr. Birkett the following particulars:—"The tumour that I removed from C. S— was a large, soft mass, protruding from the middle of the scar or scars of seventeen operations performed for the extirpation of similar tumours. Portions of the tumour were imbedded in the rectus femoris and vastus internus, and it was necessary to remove part of the sheath of the femoral vessels. At the autopsy the effects of peritonitis were found (probably of pyæmic origin), but no appearance of morbid growth of any kind in any internal organ."

**CASE.**—*Recurring fibroid tumour in the thigh; three separate operations during seven years; amputation and death.*

—A woman, æt. 39, was admitted into Guy's under Mr. Cock's care in June, 1856, with a tumour in the thigh, which she had observed for five or six years before her admission. For some years it had increased slowly, but for the last fifteen months it had grown rapidly and caused pain. It was quite moveable among the soft parts, and the skin over it was uninvolved. In July, 1856, Mr. Cock enucleated the growth, which measured six inches in diameter. It was invested by a delicate fibrous envelope, was soft, succulent, semitransparent, and of a yellowish tint. Microscopically, the elements were those of the fibro-plastic tumour. The wound healed, but a tumour again appeared, and in December was removed. A third growth made its appearance with extreme rapidity; and by August, 1857, reached from the hip to the knee; it was very pendulous, and in its greatest circumference measured forty-two inches. In August, 1859, Mr. Cock amputated the leg above the knee. The mass weighed several pounds, and was composed of large lobes of soft, succulent, yellowish tissue, loosely held together by connective tissue. A fibrous texture was observable in some of the lobes. It grew entirely in the soft parts of the limb, the bone being quite healthy. Some of the lobes were sloughing, and a large one had ulcerated through the integuments. The elements of these growths were fibro-plastic.

The patient sank from exhaustion, but there was no post-mortem examination; the lymphatic system appeared free from disease, and there was no reason to suppose that any new growths were developed in the viscera. A model of this growth, made by Mr. Towne, may be seen in the museum of Guy's.

*CASE.—Recurring fibroid tumour in the leg; four operations in eight years; amputation; death.*—E. C—, a healthy woman, æt. 41, was admitted under the care of Mr. Birkett, in March, 1853, with a small tumour, of six years' growth, in the anterior portion of the leg. It was hard, about two inches in diameter, and appeared to be firmly fixed to the fascia, but the integuments were free, and the lymphatic system was unaffected. The tumour was removed, and the wound healed, the growth presenting all the microscopical features of

the fibro-plastic tumour. At the end of July in the same year a second growth was developed near the cicatrix ; in four months it became as large as the first, and was then excised.

In March, 1854, three or four independent nodules were again to be felt ; these grew rapidly, and were removed in April, 1854. New growths appeared after this operation before perfect cicatrization had taken place, and their increase was very rapid, so that in six weeks a large mass of disease existed which had made its way through the integument of the limb, discharging a thin, inoffensive ichor ; its surface was lobed and irregular, and to the hand appeared firm. It occupied the entire upper third of the leg, and could be treated only by amputation ; this was performed in July, 1854, and the stump healed. About one month after the amputation, however, a slight induration was detected at the spot over which the pad of the tourniquet had been placed at the time of the operation, and after two weeks it became evident that a returned growth had made its appearance. This increased, causing intense suffering, and in seven months had reached an enormous size, the diseased limb measuring seventeen and a half inches more than its fellow.

In March, 1855, the lower mass had sloughed, and this was followed by hæmorrhage so profuse as to cause the patient's death.

*Necropsy.*—The examination was made by Dr. Wilks forty-eight hours after death. No signs of decomposition existed externally ; no rigor mortis. The body generally was greatly emaciated. The lungs and heart were free from disease. The alimentary canal was healthy, the liver white, and containing much fat. Spleen soft, and the corpuscles very large. Urinary and genital organs were quite healthy. None of the glands of the lymphatic system in any part of the body were diseased.

*The diseased thigh.*—The whole of the thigh, from the groin to the stump, formed a large mass, divided into two by a transverse depression. The upper and the larger formed a large, round, and hard tumour ; the lower was soft and filled with blood, which, penetrating the skin, produced a clot protruding on the surface. Thus the traces of the two separate growths, which had originally existed, still remained. The

upper tumour could be easily turned out, the integument being in no way involved, and readily peeling off. Neither the muscles nor the femur were attached to it. The muscles surrounding it, although pale, were not at all affected by the disease, and the bone was healthy. The femoral artery and vein ran through the growth, and were quite perfect; they traversed it at about the junction of the upper two thirds with the lower third of the tumour. The facility with which it could be enucleated was due in great measure to the serum which everywhere surrounded it. Although the tumour was perfectly defined, it was not enclosed in a true cyst, but the hardened and dense morbid tissue formed a tolerably firm, fibrous envelope around it; in shape it was nearly round. A section displayed a somewhat soft substance, which was, however, tough and tenacious, so that a piece of it could not be squeezed out of its original shape into a pulsatious or diffuent mass, after the manner of medullary cancer. It had a firm and leathery consistence, and contained serous fluid. About half the growth was decaying or dead; all the central part was in shreds, and contained small cavities filled with yellow serum. This necrosed part was of a pinkish-yellow colour.

The circumference of the tumour was of a pale, milk-white colour. Between this large tumour and the end of the stump was a similar morbid growth, of less size and less defined; it was rapidly decaying, and was filled with a large quantity of the fibrine of the blood. The large tumour weighed eight and a half pounds. The microscope exhibited a very uniform structure of nucleated fibres and fibro-plastic elements. The only resemblance to the elements of cancer was, that in some of the cells the nuclei were of a very large size.

These three examples of the disease I am now describing are so typical of their class that I feel it would be useless to quote any other less well-marked cases which I possess. It was my good fortune to have observed from their first admission into Guy's the cases which I have been tempted to reprint, and I think any one with moderate powers of observation who had the chance of watching the progress of the development of such a recurring fibroid tumour as existed in any one of these illustrations, would find no difficulty in diagnosing such a case from

a cancerous or malignant growth ; for even without any minute or microscopical examination of the tumour these cases present general features which are tolerably characteristic. It must be observed that these tumours, as a rule, attack the young and healthy ; they grow from a fascia or aponeurosis, are of slow growth, particularly at first, and destroy life only after many years, and from local causes. They return only either in the spot from which they originally sprang, or from its immediate neighbourhood. They affect the part simply, mechanically, by separating and surrounding tissues, but never by infiltrating them ; the skin is only mechanically stretched over the tumour, but never involved in it ; and if destroyed it is simply by ulceration from over-distension, while the absorbent glands are never secondarily involved, even in extreme conditions. Such tumours are to the hand more or less fibrous, and lobulated, their fibrous feel being much influenced by their rapidity of growth. When cut into they present a more or less compact surface, a clear serous fluid infiltrating its meshes ; and even the finest microscopical section will be found tough and tenacious, and incapable of being pressed into a diffuent mass. Under the microscope they present the characters of the fibro-plastic tumour, although with an excess of nucleated cells and nucleated fibres, this, again, showing their tendency towards the characters of the malignant growth.

---

## CHAPTER VII.

### ON CANCEROUS TUMOURS.

#### SECTION 1.

##### ON EPITHELIOMA, OR EPITHELIAL CANCER.

IN the last section a class of tumours has been briefly illustrated, evidently forming a connecting link between the innocent and so-called malignant growths ; for it has been shown that they are not so innocent as not to return after their

removal, and not so malignant as to repeat themselves in the internal organs, nor to affect the body through the lymphatics, nor infiltrate the parts with which they come in contact. In the class of tumours we are now about to consider, it will be seen that a further and more advanced step is taken towards malignancy, for these epithelial tumours have both a tendency to return in a part after their removal, and to affect the system through the lymphatics. In rare cases, also, they may be found in the internal organs. These tumours, however, always affect the skin or mucous membrane, and never originate in any other tissue, but they possess this feature in common with the more malignant cancers, that they have a constant tendency to infiltrate the parts with which they come in contact, and do not, as has been already shown with the innocent tumours, simply separate them. They are the common forms of cancers found in the lip, tongue, œsophagus, vulva, clitoris, penis, and rectum ; and may be described as the cancer of the skin.

It is not my intention, in these pages, to consider the subjects of cancer of the lips, tongue, or rectum, for they have been already discussed in former pages, nor of cancer of the female genitals and penis, which may be illustrated at another time ; in my present communication I would treat rather of the external or cutaneous tumours, and I have the records of twenty-two examples, including cancers of the integument of the head, face, sternum, and extremities. They all occurred in male subjects, and at a late period of life. They were all of slow growth ; in some cases many years had passed before advice was sought ; and, in all, the general health of the patient was good.

Epithelial cancer is essentially an infiltrating disease ; it is not, as the sebaceous and fatty, fibro-plastic and fibrous tumours, a distinct growth developed in the tissues and separating them, but it is, from its very beginning, an infiltration. It begins, as a rule, as a little wart or tubercle, and this gradually spreads ; it may crack, fissure, or ulcerate, and when this latter stage has been arrived at, the careful examiner will at once observe its true character, for the integument forming its margin will be evidently infiltrated with the cancerous material, and will present the well-known indurated and everted edges, these appearances forming a marked contrast to the con-

dition of integument which has been ulcerated or ruptured by over-distension in a simple or innocent growth, for these edges are never thickened, or infiltrated with any new matter; unless it be with inflammatory products. As a local disease, this epithelioma may slowly progress for years, and cause little pain, inconvenience, or injurious influence. Five, six, eight, or fifteen years have passed away in some of the cases before me, ere advice was sought; and it may, indeed, continue for many years, and never affect the patient more than as a local disease.

CASE.—*Epithelioma of outer canthus of eye; excision.*—A sweep, æt. 41, was admitted, March, 1860, with an epithelial cancer at the outer canthus of the eye, of eight years' growth. His health was good, and no glandular affection existed. It was excised by Mr. Poland, and recovery ensued.

CASE.—*Epithelioma of cheek; treated by caustics; recovery.*—A fisherman, æt. 70, was admitted into Guy's, under Mr. Cock, in April, 1863, with a large cancer of the cheek, the size of a crown, and of six months' growth, the edges being very raised, thickened, and everted. It was destroyed by the frequent application of a paste composed of equal parts of chloride of zinc and plaster of Paris. The man left cured.

CASE.—*Epithelioma of the dorsum of the hand; old cancer of the lip, six years previously; indurated axillary glands.*—A man, æt. 66, was admitted, in February, 1859, with an extensive cancer on the dorsum of the hand, of four years' growth, and secondary enlargement of the axillary glands, of two months' standing. He had had a cancer removed from his lip six years previously, and no return had taken place. He left without any treatment.

CASE.—*Epithelioma of dorsum of hand; amputation, recovery.*—A healthy man, æt. 69, was admitted by Mr. Cock, in November, 1856, with an extensive cancerous affection of the dorsum of the left hand, but with no other sign of disease. Amputation of the hand was performed, and good recovery followed, the stump healing by primary union.



**CASE.**—*Epithelioma of heel, involving os calcis; amputation and recovery.*—A healthy man, æt. 36, was admitted into Guy's, under my care, in July, 1858, with an extensive ulceration of the heel and side of the foot, accompanied with disease of the os calcis, the whole bone being excavated and involved. The disease had existed twenty years, having gradually become worse after an injury he sustained at that time. The lymphatic glands of the limb were quite sound.

Nothing but amputation could be entertained. This was accordingly carried out, and a good recovery followed.

On examining the part, a most beautiful specimen of epithelial cancer was to be observed. It had evidently commenced in the soft tissues, and passed deeply down into the bone, for its cancellated tissue was infiltrated and filled with the epithelial cells, characteristic of this structure; indeed, I have never witnessed a more perfect microscopical specimen of epithelial disease; and may add that, when this affection attacks bone, the same condition may be always observed.

In the cases I have already given, examples of epithelioma, as a simple local disease, have been quoted, as being treated successfully by excision or the application of a caustic, and others in which the severer measure of amputation was considered requisite. Illustrations have also been related of this epithelial disease affecting the system through the lymphatics; and in one case it had passed from the skin or tissue, in which it had originally commenced, and by its infiltrating powers had produced extensive disease of the bone beneath.

In the two following examples, another of its features is well shown, viz., its tendency to return in the part in which it originally grew, for in both these cases an apparent cure had been effected on many occasions, only to be followed, however, by an early return of the disease.

Both these cases have been under the care of Mr. Birkett, but I have had abundant opportunities of watching the progress of the affection.

**CASE.**—*Epithelioma of the integument over the sternum; numberless operations and apparent recoveries; return of the disease.*—J. M—, a remarkably healthy man, æt. 50, came

under my notice with epithelioma of the integument of the upper portion of the sternum, in October, 1853, having been a patient of Mr. Birkett's for some years; and he was then admitted under that gentleman's care into Guy's Hospital. He had a cancerous ulcer over the sternum, about the size of a crown.

The disease had first appeared nine years previously as a wart, and three years before his admission, when it had reached about the size of a florin, Mr. Birkett excised it, the wound healing in three weeks. He remained well for two years, when the present growth appeared, and on this occasion it was again excised, with the same result. The disease again reappeared, to be again removed, and from that time up to the present year this alternate cure and fresh eruption of disease has been going on, and for years past the destruction of the cancer has been readily obtained by the chloride of zinc paste.

The man's health is still good, and no indication of secondary glandular affections are to be detected, but the cancer always re-appears after its removal.

CASE.—The next case is precisely of the same character as the one already quoted, and also occurred in a patient of Mr. Birkett. Dennis C—, æt. 50, was admitted into Guy's, in November, 1857, with an extensive cancerous ulceration of the integument on the upper portion of the sternum and lower portion of the neck, having existed for three years. The application of Burnett's solution of chloride of zinc, in the concentrated form, caused its removal and cicatrization, and for two years he remained well, but in 1860 he again returned with the disease as bad as ever,—it was again destroyed by chloride of zinc, used as a paste, with the same result, and for the last ten years he has been quite well. The man's health was still good, and the lymphatic glands unaffected.

## SECTION II.

### ON CANCEROUS TUMOURS.

What is a cancerous tumour, of what is it composed, and how is it to be recognised? are three questions which the student is constantly asking—and I imagine there are few ques-

tions which are more difficult to answer with any accuracy, or satisfaction to the inquiring mind.

Pathologically, a cancerous tumour is not composed of any definite or characteristic elements, such as at once stamp it as being a cancer; it does not contain any distinct cancer cells which mark its nature, for the cells, nuclei, and fibres, which enter into the formation of a cancer may all be traced in other and in innocent morbid growths. It does not appear, however, to be incorrect to assert that the more the cell element predominates in a growth the greater is the probability of its being malignant, and therefore cancerous; for the soft cancers, which are undoubtedly the most virulent, are made up almost entirely of cells and nuclei—only enough fibre tissue existing to bind and hold these cells together.

It has been already shown how the so-called innocent tumour approaches the malignant in some of its features; and it will have been observed that those which form the intermediate links between the innocent and malignant, structurally approach the latter, in having more of the cell element in their composition; the fibro-nucleated and recurring fibroid tumour existing as proofs.

But these points touch only the anatomy of those growths, and not their symptoms; they do not assist the surgeon to make out before its removal whether the tumour before him be a cancer or not.

What, then, are the external and general symptoms by which this point can be determined?

If a tumour is found in a part, infiltrating the tissues with which it is in contact, there can be little if any doubt as to its being a cancer, for no innocent growth infiltrates a tissue—it simply separates them. This question of infiltration of a part, or merely separation, is most important, and is, doubtless, one of the most valuable means we possess for the purposes of a correct diagnosis.

A cancerous tumour does not, however, always infiltrate a part, although an infiltrating tumour is almost always a cancerous one; for it may appear as a distinct and isolated growth, being then, in surgical language, described as tuberos. What, then, are the symptoms by which a tuberos cancer may be known? And first of all, has the tumour itself any peculiari-

ties by which its nature may be recognised? Unfortunately, a negative answer must be given to this question, for although it may not be an unfair thing to suspect the presence of a cancer when the tumour does not present any of the special appearances or symptoms which commonly characterise the innocent growths, it can only be a suspicion, as many innocent tumours are often deficient in the special symptoms, which, when present, readily attest their true nature.

A subcutaneous tumour, unconnected with the integument, with an irregular bossy outline, and of a firm, fibrous feel, will, in all probability, be a simple tumour, for these are not the characters of a malignant one; but a tumour with a smooth uniform external surface may be from these symptoms alone either a simple or malignant growth. We must, therefore, look to other than local, although concomitant symptoms, to aid us in a diagnosis. I have already alluded to the tendency which the malignant tumour possesses to involve the tissues in its neighbourhood, and have remarked that this tendency does not belong to the innocent growths; if, therefore, any adhesion or drawing in of the integument to the surface of the growth can be detected, the suspicion of its being a cancer may be entertained.

But we will now pass on to another symptom, which, if present, is most characteristic of the cancer; and that is, a secondary glandular, lymphatic enlargement; for if this symptom is present with a doubtful tumour, the probabilities of its being cancerous become very strong, for I have already stated that the innocent and non-malignant tumours are rarely, if ever, attended with enlarged lymphatic glands.

A distinct and isolated tumour, therefore, which does not possess any of the special characters of a simple growth; which is attended with some evidence of secondary affection or infiltration of the parts, and with which an enlargement of the lymphatic glands in its neighbourhood exists, may safely be regarded as cancerous. It is, however, only in the early stages of the development of a tumour that a difficulty in diagnosis is usually felt, for in the long-standing and well-developed growth the diagnosis, as a rule, is not difficult.

The soft, and so-called medullary cancer, is the form which is usually met with during young life; it makes its appearance

generally suddenly, and often after the receipt of some blow or injury; it grows very rapidly, and presents a surface which is, as a rule, smooth and uniform, or of a semi-solid and fluctuating feel, and with large full veins wandering across. It is known by its sudden appearance, rapid growth, and uniform surface, these points being very different to those which simple tumours present, these innocent growths being generally slow in their development, and more marked in their outline. The cases of medullary or soft cancer run their course very rapidly, and destroy life within a very short period of their development.

The hard cancers are the affections of middle age and adult life. They grow more rapidly than the innocent growths, seldom requiring more than a few months to establish their true nature; they seldom put on the external appearances of a simple tumour, and never exist long without assuming features which are more specially characteristic of cancer, the implication of neighbouring tissues and secondary glandular enlargements being the chief points.

It is hardly necessary to quote cases of cancer to illustrate these remarks. Out of the 39 examples I possess of cancerous tumours not affecting any special organ (for the cancer of the breast, testicle, and bones will be considered with the tumours of those parts on another occasion), 14 of these cases are examples of intermuscular cancer; 4 of the parotid; 13 of the lymphatic glands; 5 subcutaneous; and 1 of the tonsil. But a further analysis of these materials must be postponed, as it is my intention to take the cases of cancer as a whole, for the purpose of analysis, after I have considered the cancers of the special glands and parts.

#### *On Melanotic Cancers.*

If it were necessary to adduce a forcible illustration of a pathological fact which is now pretty generally accepted by pathologists, the development of melanotic cancers might be made of great value; for the natural history of both these primary and secondary melanotic growths proves that a cancer when first developed in a part, in a measure partakes of the nature and peculiarities of that part, and even when repeating itself in the lymphatic glands and internal organs, still pre-

serves the characters which it originally acquired from the seat of its primary development. This pathological truth, as has been already shown, is as applicable to innocent growths as to other cancers, but the natural history of the melanotic form is perhaps the strongest argument in its favour. A melanotic cancer always grows from a part which naturally contains pigment, and a mole is unquestionably its commonest seat. It may be, perhaps, that the secondary glandular enlargements, in their rapidity of growth, outstrip the tumour from which they originally imbibed their peculiar nature; nevertheless their true character is maintained and preserved unto the end. The soft or medullary cancer is the form with which the pigment is invariably associated, and I know of no exception to this fact. This cancer, as a rule, runs a very rapid course; an extreme example of melanotic cancer being typical of the worst form of the other varieties.

I possess the records of seven very interesting examples of these melanotic cancers, and shall therefore quote the brief notes of some of the most characteristic.

CASE.—Mary R—, æt. 30, a married woman, was admitted under my care, into Guy's Hospital, on April 3rd, 1854; she was a healthy-looking woman, with a dark complexion, and from birth had had a mole on the front part of her right leg. It had never grown, however, or caused any inconvenience, till two years previously, when it began to enlarge, and after eight months' growth was excised. The wound had hardly healed when other growths in the same locality made their appearance, and from that date they multiplied very rapidly. On admission, the whole of the anterior portion of the leg was studded with melanotic cancers; some were as small as millet seeds, and lying beneath the skin; others, of larger dimensions, were infiltrating the integument; some were unbroken, and others, again, had softened down, leaving open cancers. The inguinal glands were also enlarged. Under these circumstances nothing by way of operation could be done, and she therefore left the hospital unrelieved.

A model of this limb may be seen in the Guy's Museum.

CASE.—Thomas G—, æt. 30, a potter, was admitted into

Guy's, under my care, in January, 1863. It happened that, two years previously, a mole, which had existed from birth over the ensiform cartilage, began to enlarge, and about the same period a tumour made its appearance at the margin of the axilla. He applied for advice at a large hospital, where the mole was removed, and, as a return growth immediately appeared, a second operation was carried out, in May, 1862, two months after the first. From this time the axillary tumour gradually enlarged, and on admission it was about the size of an orange; other tumours also appeared, and these, when coming under observation, were studded all over the abdominal walls. When admitted, the man was extremely pale and cachectic; his pulse was very weak, and his powers were failing. Tonics, good living, and wine were freely given, without advantage, the tumours rapidly increasing and fresh ones making their appearance. In a few weeks a dry cough set in, followed in a short time by pneumonic expectoration, and from this time he gradually sank, without any other definite symptom, dying on March 14th, 1863. It may be added, that he had no head symptoms.

*Autopsy, by Dr. Wilks.*—A number of nodules were on the body, consisting of soft cancer containing pigment, none being absolutely black. On removing the *brain*, fluctuation was felt in the left hemisphere towards the median line, and on cutting it through, a very loose growth was found, about the size of a walnut, consisting of a distinct vascular wall for outline, and within very little more than a few threads passing across it, and within these some serum. When this flowed out, almost a complete cavity was formed. It thus appeared, at first, to be nothing more than an inflamed cyst, but there was sufficient structure in the adventitious material on the walls to show its cancerous nature, and its resemblance to the other growths in the body; there was, apparently, however, no pigment. The *lungs* were full of tumours; probably about half of each was thus occupied, many of them were very large, as large as an egg. When cut, they were found mostly of a brownish hue of different degrees of intensity and shade, some almost white, others brown from the presence of pigment. The bronchial and mediastinal glands were similarly affected. The *heart* had on its front surface, and imbedded in the walls of the right

ventricle, a tumour the size of a marble, which was also cancerous, and contained a small amount of pigment. The *liver* was full of pigmental cancer, the tubercles being smaller than those in the lung, and situated more upon the surface of the organ. The *spleen* contained also two masses. The *lumbar* glands were also diseased, and contained much pigment, as also were the *mesenteric*. There were also a few growths in the *pelvis*, and one black nodule growing from the anterior wall of the mucous membrane of the *bladder*. There was no disease in the kidneys.

---

## CHAPTER VIII.

### ON THE CARTILAGINOUS TUMOUR, OR ENCHONDROMA.

It is well known that the largest proportion of the cartilaginous tumours which are met with in practice are connected with bone, but these cases will have to be considered with the tumours of that structure. On the present occasion it is proposed to confine our remarks to the independent cartilaginous tumours, such as are most frequently found in the region of the jaw, but which may be developed in other parts. It is unquestionably true, however, that a large proportion of the innocent tumours developed in the neighbourhood of the parotid or submaxillary gland contain cartilage as a part of their structure, although the causes of such a connection are completely hidden from our knowledge. But it is not to these that the present pages will be devoted, for cartilage forms the chief structure of the tumours which we are now considering.

I possess the records of 12 examples of the enchondromatous tumours; 11 of these were developed in the region of the jaw, and 1 on the leg as an independent intermuscular tumour. Of the 11 developed in the neighbourhood of the jaw, 9 were situated in the parotid and 2 in the submaxillary glands. All were excised, and with success. These tumours, as a rule, appear in young subjects and in people under middle age; in only one example out of the twelve did the disease appear after thirty years of age, seven cases first developing before the age of



twenty; and, curiously enough, only two of the cases occurred in male subjects. I am not aware whether this greater tendency of females to the development of such growths is general, but the fact, as already stated, seems worthy of record. These tumours are also slow of growth; the shortest period noted in these examples before me was one and a half years, but three, four, six, twelve, and fourteen years, appear to be the usual time before they attain a sufficient size to make the patient seek advice. In none of the parotid tumours was there any affection of the facial nerve, and this point is one of value for diagnosis, for in the majority of simple tumours developed in this region the nerve is not involved; although there are exceptions to this rule, one of which I have quoted amongst the fibro-plastic tumours. But it must be added, that in the cancerous tumours which generally infiltrate the parotid, the nerve is almost always implicated, the exception existing when it is left free. These tumours are always encysted, and have a smooth, tense, and elastic feel; in some examples they are uniform and even, in others they are bossy and nodulated; they rarely cause any pain, and produce anxiety simply from their position and size. They, as a rule, appear to grow superficially to the parotid or submaxillary gland, but often dip down deeply into these structures, and require considerable care, therefore, in their removal. They are often, also, very adherent to the parts around. They are simple tumours, and consequently only separate the parts between which they are developed, never involve the integument, but only stretch it, and do not affect the system through the glands, although it must be added that rare examples are on record in which cartilaginous tumours have returned, and have affected the lymphatic system like a cancer. Their removal by excision is the only correct treatment, and a vertical incision is the best when the parotid region is the seat of the disease, so directing it that the cicatrix may be as far backwards as possible.

The following are the brief notes of some of the cases.

CASE.—Jane H—, æt. 16, came under my care, 1857, with an enchondromatous tumour over the left parotid gland, the size of a large walnut, of six years' growth; it was quite painless, and moveable, and had a smooth and uniform surface. It was

excised, a bossy outgrowth at its base being found deeply placed within the gland. Recovery followed.

CASE.—*Enchondromatous tumour beneath jaw, size of orange; excision.*—A woman, æt. 24, came under my care, in November, 1861, with a large tumour, the size of an orange, beneath the left ramus of the lower jaw, of fourteen years' growth. It was nodular, elastic, and moveable, and gave rise to no pain. It was excised without difficulty, and recovery followed.

CASE.—*Enchondromatous tumour beneath the biceps femoris; cure.*—A woman, æt. 30, was admitted into Guy's, in February, 1858, under the care of Mr. Birkett, with a large tumour, the size of a cocoa-nut, beneath the right biceps femoris muscle. It had been growing for two and a half years, and had caused pain only from its size. It was readily excised, and was made up of cartilage-cells, bone, and fibre-tissue.

# SEBACEOUS TUMOUR WITHIN THE TYMPANUM

ORIGINATING ON THE

EXTERNAL SURFACE OF THE MEMBRANA TYMPANI,  
BANDS OF MEMBRANE OCCUPYING THE CAVITY.

---

By JAMES HINTON.

---

THE following case appears to me interesting in relation to aural pathology, in two respects: as exhibiting an early stage of a very serious form of disease, which seldom attracts attention until far advanced; and as bearing upon the interpretation of certain appearances frequently detected within the ear upon dissection, but the true significance of which is as yet not sufficiently made out. Since the aural affection seemed to have no connection with the cause of death, the history of the fatal disease is omitted.

Catharine H—, æt. 18, was admitted into Guy's Hospital, under the care of Dr. Rees, on May 15th, 1863, and died on the 25th. The symptoms at first resembled those of fever, but soon became indicative of a cerebral affection. On examination there was found recent tubercle in the membranes of the brain, with a small amount of lymph over the hemispheres, and fluid in the ventricles. No tubercle was discovered in any other organ.

Having frequently found deposits of morbid material within the tympanum in cases of tubercular disease of the brain, I removed the petrous bones for examination. Externally, they presented nothing abnormal. On the right side, the meatus

contained some desquamating scales of epidermis; the membrana tympani was translucent, but at its posterior portion it presented a small depression where the membrane appeared thin, as if from loss or non-development of the fibrous laminæ. Superiorly, immediately above the short process of the malleus, there was what appeared externally to be a perforation, about a line in width by half a line in height. On opening the tympanum a small mass, of brownish-red colour, and about the size of a pea, was seen to be situated just above, and external to, the head of the malleus, evidently in immediate connection with the aperture in the membrana tympani. At first sight this mass suggested the idea of a tubercular deposit, but, on further examination, it was found to be surrounded with a distinct, though thin, vascular membrane, which was continuous with the edges of the aperture in the membrana tympani. The tumour thus appeared to be contained in a sac formed out of the substance of the membrana tympani, on the outer surface of which it had commenced, projecting from thence into the tympanum. Its contents consisted of small, whitish flakes, analogous to those which are found in what are termed "sebaceous tumours;" several cases of which occurring in the meatus, and proving fatal by extending through the bone, and setting up suppuration within the brain, have been recorded by Mr. Toynbee.<sup>1</sup> In the present instance there were no indications of its having caused any irritation of the surrounding parts, nor did the bony walls of the tympanum appear to be infringed upon.

In addition to this small tumour, the cavity of the tympanum and the mastoid cells contained numerous "membranous bands." The form and position of those in the mastoid cells, as well as the tumour above described, are represented in the accompanying drawing (Cut No. I). These bands were soft, but very strong, and of a pale, flesh colour. In the tympanum they were paler, but almost equally firm. They connected especially the incus, stapes, and inner wall of the cavity. The stapes, however, was freely movable in its articulation with the vestibule. The mucous membrane of the tympanum showed no other sign of disease, being of its natural thin and pale

<sup>1</sup> 'Medico-Chirurgical Transactions,' vol. xliv.

appearance. The labyrinth was normal, as was also the left ear in all its parts.

It is to be regretted that in this case the ears were not examined during life; but it is perhaps hardly less instructive to know that there had never existed any symptom which might have directed attention to them. It appeared, on strict inquiry, that there had never been discharge from the ear, complaint of pain, or deafness. This statement was made by the patient's mother, and confirmed, as to the last months of her life, by a woman who had been her special friend, and by a fellow work-girl. She had suffered great privation, and for six months before her illness had complained much of headache. While in the hospital her sight was impaired, but her hearing was not observed to be so.

The existence of one sound ear necessarily leaves it doubtful to what extent the power of hearing, in this case, was maintained, but there seems no reason to suppose that it was much affected. The tumour was not in a position to interfere with the conduction of sound; and, in spite of the numerous "bands," the ossicula were freely mobile. I have had previous opportunities of convincing myself that, when this is the case, the presence of such bands in the tympanum does not necessarily occasion deafness.<sup>1</sup> But this specimen seems to afford evidence that at least a certain number of cases of "membranous bands in the tympanum" should be removed altogether from the category of morbid conditions. It was impossible to look at the bands as they were contained in the mastoid cells without feeling convinced that disease, in the ordinary sense, had nothing to do with their production. They were evidently a natural formation, remnants, probably, of a previous structure, which had incompletely wasted; evidences of an imperfect "vacuolation" of the tympanic cavity.<sup>2</sup> Their entire appearance was that of an ordinary membranous structure, supplied in the usual way with blood-vessels, and covered with the usual layer of epithelial scales. This was less decisively the case, indeed, with the bands which united the ossicula to the tympanic walls; but if the bands in the mastoid cells be a natural

<sup>1</sup> See the 'Medico-Chirurgical Transactions,' vol. xxxix.

<sup>2</sup> For this suggestion, I am indebted to Dr. Gull, who kindly examined the specimen with me.

formation, it is hardly possible to assign a different character to the others. It is needless to point out how entirely the history confirms this view.

It has, indeed, long appeared to me that there are many difficulties in ascribing to "membranous bands in the tympanum" a primarily morbid character. Adhesive bands certainly form in inflammation between adjacent surfaces, but much less frequently between mucous than between serous membranes, and, so far as we have evidence in any other organ than the ear, only when the parts move one upon the other, to which motion there is no parallel within the tympanum. Such bands, again, are found within the ear with so great a frequency, and in so many cases in which the history excludes the idea of severe inflammatory action, as to render the view of their being due to such action at least improbable. Guided by the present case, I conceive it would be most reasonable to ascribe membranous bands of firm and well organized consistence, when found within the tympanum or its subsidiary cavities, to an imperfect development, through deficient wasting, unless there be clear evidence, from the history or otherwise, that they have a different origin. It is not denied that in some cases bands are met with, presenting marks of a morbid character, being of dull granular surface, dark in colour, or infiltrated with blood. But in such cases these peculiarities are accounted for by a general inflammatory action, affecting the bands in common with the rest of the mucous membrane of the tympanum, but without being concerned in their formation. From such general inflammation it might well happen, indeed, that bands previously existing and exerting no injurious influence upon the organ, might become thickened and contracted, binding the ossicula rigidly together (as is occasionally seen), and so occasion a high degree of deafness.

In this way the presence of these formations may be prejudicial, as tending to render the supervention of a rigid condition within the tympanum, as an effect of inflammation, more probable than it might otherwise be. For their special diagnosis in such cases, apart from rigidity existing independently of them, no reliable means at present exist. It has been suggested by Erhard—though on wholly theoretical grounds—that deafness progressing rapidly to a certain point, and then

remaining constant (supposing its cause to be diagnosed as lying in the tympanic mucous membrane), might be ascribed to the presence of bands, while, if gradually increasing, it should be assigned rather to general thickening of the membrane. This theory awaits the test of demonstration. In the mean time, if it be true that these membranous bands are rightly to be regarded as morphological rather than as morbid elements, there will exist in our nosology one less incurable affection of the ear.

In respect to the sebaceous tumour found in this case, it presents no other peculiarities than its small size and its place of origin. I am not aware that they have before been found implicating exclusively the membrana tympani. They appear to be not uncommon among the young. Little doubt can be entertained that, if the patient had not succumbed to the cerebral affection, danger to life would have hereafter arisen from the progressive enlargement of this tumour—a danger which only its removal could avert. The proper treatment, therefore, if a similar case should present itself during life, would appear to be, to incise the membrane, and endeavour, by unirritating means, to evacuate the contents of the sac.

PLATE,

*Exhibiting Petrous Bone with Sebaceous Tumour, &c.*

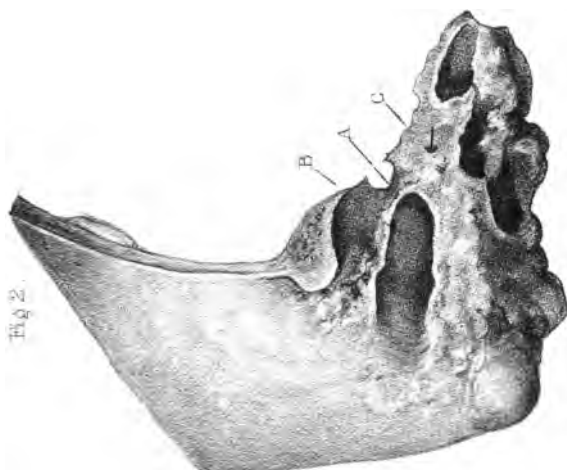
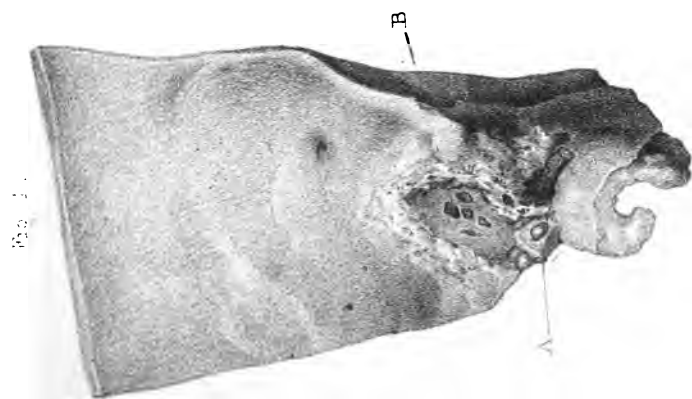
*Fig. 1.* Showing the tumour, and the bands in the mastoid cells.

- A. Tumour.\*
- B. Membranous bands occupying the mastoid cells.

*Fig. 2.* Showing the external appearance of the membrana tympani.

- A. Membrana tympani.
- B. The aperture in the membrane.
- C. Eustachian tube.

\* Owing to unforeseen circumstances, occurring too late to remedy, this figure, while showing the position of the tumour, does not correctly represent its form.







A  
COLLECTION OF CASES  
OF  
FOREIGN BODIES IN THE STOMACH AND  
THE INTESTINES.

---

By ALFRED POLAND.

---

IN a former volume of the 'Guy's Hospital Reports' we had occasion to refer to cases of contusion of the abdomen, accompanied with injury to the stomach and intestines, and we promised then at some future time to enter upon the subject of wounds of the stomach and intestines. However, before doing so, we thought it advisable to present for perusal a collection of cases of foreign bodies in the stomach and intestines; although this is extremely imperfect, and for the most part has already been anticipated by the excellent article by Mr. Pollock in the new 'System of Surgery,' edited by Holmes, yet we could not allow the opportunity to escape of filling up a few vacant pages in the 'Guy's Hospital Reports.' We cannot indeed boast of having had much practical experience in these kind of cases, on account of the rarity of the occurrence in hospital and general practice, yet we have been consulted in such cases as to the propriety of gastrotomy, and we have therefore paid some little attention to the views expressed by those who have gone before us, and who have left behind some record of their doings. The immediate object of this collection is, 1st, to ascertain whether we are enabled to detect foreign bodies in the bowels; and, 2nd, if so detected, whether they can be justifiably removed. We have always been an advocate for collective experience rather than individual, and we will quote

from M. Hevin in the 'Memoires de l'Academie de Chirurgie' his views on this very point :

"It is necessary that all points of theory and practice should be displayed by all the facts which may tend to explain, determine, and prove them, so that one may judge by the materials collected of the solidity of the work : these will derive more benefit from our efforts and researches than from our own individual experience."

Again he says :—

"The experience of the most practical physician is very limited. Great experience consists in general history of facts. The surgeon who confines himself to the experience which his practice gives him, consumes all his days in learning only a small portion of things which have been written for several ages, and of which he could have instructed himself fully and in much less time by the history of facts of practice which have been left by those who have preceded us in the exercise of the art. Individual experience is nothing in comparison to the general experience which is formed by the collection of discoveries and observations handed down to us by many practitioners who have lived at different times and in different places. But we are not to accumulate cases uselessly, such as when they are much alike, and when they do not lead to results; however, collections may be of service when determining number and rarity, &c. It is needless to record those of daily occurrence, or where the practice is thoroughly established."

We propose taking in detail, 1st, Foreign bodies in the stomach; 2nd, Foreign bodies in the small intestines; and 3rdly, Foreign bodies in the large intestines. We shall introduce the cases first, and then make any remarks or deductions derived from their perusal.

### I.—FOREIGN BODIES IN THE STOMACH.

There is no doubt but that the majority of foreign bodies which are swallowed and have passed into the stomach produce little or no inconvenience, or any serious result; seldom remaining in the organ, but passing rapidly on, threading their way through the intestinal canal, and finally being expelled with the

motions. So much so, that any substance of a moderate size and smoothness is heedlessly regarded, and a few doses of castor-oil is administered, and the evacuation into the chamber utensil is anticipated as a matter of course. Yet such is not always the case, as the following examples will amply prove. It is best to arrange the foreign substances into two classes, viz., soft and hard; and of the hard bodies we shall divide them into, 1st, Rounded and smooth, such as pieces of money, rings, stones, balls, &c.; 2nd, Pointed substances, such as needles, pins, pieces of bone, &c.; and 3rd, Elongated and more formidable, blunt or cutting instruments, &c., such as knives, forks, razors, scissors, &c.

A.—*Soft substances engaged in the stomach, and acting as foreign bodies.*

These are by no means common, as the gastric juice with its powerful solvent qualities would hardly allow this to happen; yet we meet with such cases. Thus there is an instance where a piece of veal has remained in the stomach for four months, attended with severe symptoms, and only relieved after its evacuation by vomiting.

Under the head of depraved appetites, Dr. Mason Good remarks: "Whatever the cause, when this morbid propensity has once obtained a triumph over the natural taste, the substances for which it excites a desire are often not only of the most indigestible but disgusting quality. We have had examples of an inclination for devouring dirt, cinders, ordure, fire, spiders, lice, toads, serpents, leeches, bits of wood, squills, hair, candles, and more literature, in the form of paper and printed books, than is devoured by the first scholars in Christendom."

Borelli (Cent. i, Obs. 24, 52; ii, 37; iv, 25) gives numerous examples of these, and some of them of a very extravagant kind.

Mr. John Hunter ('Obs. on the Diseases of the Army in India') describes a longing for dirt, in the form of clay or loam, to have been an endemic disease among the blacks in Jamaica.

Dr. Darwin ('Zoonom.,' ch. iii, i, 2, 19) states that he once

saw a young lady, about ten years of age, that had filled her stomach with earth out of a flower-pot, and then vomited it up with small stones, bits of wood, and wings of insects amongst it.

**CASE 1.**—In the 5th volume of 'Path. Trans.,' Dr. Bucknill records the case of a man, æt. 22, subject to epilepsy and maniacal excitement, who died from peritonitis. There was found a perforation in the stomach larger than a shilling, situated at the smaller curvature of the stomach, with dark-coloured and rugged edges. The peritoneum was in a state of universal inflammation. On opening the stomach there was found a mass, about four pounds in weight, composed entirely of cocoa-nut fibre, with bits of string, &c. The mucous membrane was healthy, except at the seat of ulceration.

**CASE 2.**—In the 'Path. Trans.' 1851-52, p. 327, is the case of a young woman, æt. 18, who had suffered from pain about a tumour in the epigastric region, and had frequently vomited after her meals. She subsequently became sickly, and she appeared childish for her age. After a severe attack of vomiting and much pain about the tumour, she became collapsed and died. On examination, the cavity of the peritoneum contained several ounces of purulent serum, and the general surface of the intestines afforded evidence of recent peritonitis. On opening the stomach a large mass of hair and string, matted completely together, was found occupying the greater portion of the cavity, and moulded to the shape of the stomach: a narrow piece projected into the pyloric end. The hairs were long and black, and were matted together with pieces of string and particles of food. The mass measured when dry six inches in length, three and three quarters in depth, and two and a half across, but was much larger when first removed from the body. Another mass occupied the lower portion of the duodenum and commencement of the jejunum. This portion of the bowel was considerably dilated. This second mass consisted of a smaller quantity of hair than that removed from the stomach, but of a larger proportion of string. The mass was fourteen inches in length, two and a half in depth, and two and a quarter broad in the thickest

part. The specimens are contained in the museum of St. George's Hospital.

(B) *Hard Substances.*

1. *Rounded and smooth bodies*, such as fruit stones, balls, stones, pieces of money, rings, &c. These are also generally got rid of without accident by the stomach, but it is the intestines generally which suffer from these kinds. However, there are many recorded cases of their impaction in the stomach.

Kirchring ('Specilag. Anatom.,' Obs. 1) states that an infant of five years died after having swallowed a very small piece of money, which had entirely blocked up the pylorus. The same accident occurred to another infant, and had the same results, attended with violent vomiting. The piece of money was likewise engaged in the pylorus ('Ephem. Germ.,' Cent. 3 and 4, Obs. 121). Adults are exposed to the same danger, of which several examples are recorded (W. Boneti, 'Med. Septent. de Œsop. Affect.,' lib. iii, sect. 1—9; 'For. Hild.,' Cent. 6, Obs. 35; 'Ephem.,' Ann. 4, Cent. 10, Obs. 182).

CASE 3.—Case of M. Vaillant, M.D., a celebrated antiquary. On returning to France he was pursued by a corsair; had fifteen gold medals on him; swallowed them in order not to lose them. He escaped, but his first attention was to recover the medals. The stomach did not seem inclined to take care of them, and he suffered most severely; he consulted the faculty of medicine, and as each suggested something different, he resolved to leave it to nature, and soon afterwards they were passed.

CASE 4.—W. —, æt. 46, the subject of epileptic fits, and during the fits was accustomed to introduce a crown-piece between the teeth, to prevent the tongue from being bit. He accidentally swallowed it, and with much difficulty it passed into the stomach. This was followed by inflammation and painful deglutition, which subsided. On 19th September, 1772, he had a bilious attack, and was ordered an emetic, which was repeated three times; the fever went off, and he was recovering, when on 26th November, 1772, vomiting again came on, and he brought up the crown-piece without any pain, after it had lain in the stomach from the 12th of March, 1771, to 26th

November, 1772. He had no return of the epileptic fits. The crown-piece appeared black, and somewhat corroded round one part of the edge and surface. ('Med. Trans. Coll. of Phys.,' Lond., vol. iii, p. 30.—Dr. Coyle.)

*In the Guy's Museum, Prep.* 1894<sup>85</sup> shows a mass of stones passed per rectum by a lunatic, who had swallowed them to destroy life. Seventy-two were passed, weighing seven ounces. Presented by W. P. Kirkman, Esq., Suffolk County Asylum.

2. *Pointed and angular substances*—needles, pins, glass, buckles, &c.

Needles and pins have been often swallowed, and various results arisen. Sometimes these traverse the tissues without pain or irritation, and are spontaneously eliminated at different parts of body—at the abdominal parietes, bladder, vagina, and even feet. At other times they produce excessive pain in the stomach and intestines, and not ceasing until expelled. Sometimes they pierce the stomach or intestines, inflame the viscera and the parietes, and cause death.

CASE 5.—In the 'Lancet' of 1825, p. 240, there is a record of a patient from whom 395 needles were extracted by Dr. Otto, of Copenhagen, thus showing how nature sometimes gets rid of these bodies. Rachael Hertz; from 12th of February, 1819, to 10th of August, 1820, 295 needles extracted, as follows:

From left breast	.	.	.	22
„ between breasts	.	.	.	14
„ epigastric region	.	.	.	41
„ left hypochondrium	.	.	.	19
„ right hypochondrium	.	.	.	20
„ navel	.	.	.	31
„ left lumbar	.	.	.	39
„ right lumbar	.	.	.	17
„ hypogastric	.	.	.	14
„ right iliac	.	.	.	23
„ left iliac	.	.	.	27
„ left thigh	.	.	.	3
„ right thigh	.	.	.	23
„ between shoulders	.	.	.	1
„ beneath left shoulder	.	.	.	1
Total	.	.	.	295

From 26th of May, 1821, to 10th of July, 1822, 100 more were extracted.

CASE 6.—Pinet relates the case of a girl of ten years of age, who passed in the space of twelve or fifteen days more than fifty needles of different lengths, which she had swallowed five or six years before. During this time she complained only of occasional pains in the stomach and belly; she suffered much, and passed blood at their evacuation.

CASE 7.—Hildanus records the case of a lady who accidentally swallowed several pins, and experienced at the moment acute pain in the œsophagus, which subsided. She had afterwards fixed pain in the œsophagus, especially on swallowing solid food, and then had pricking pains at the bottom of the stomach and in several parts of the belly. These continued a long time, and the pins were not rejected for six years afterwards.

CASE 8.—Bayle mentions one of a girl aged eighteen years, who swallowed some pins. For some days after, she had great pain in the different parts of the abdomen; these were followed by dysentery and violent cuttings, with syncope and frequent convulsions. She rapidly emaciated, and died in three weeks.

CASE 9.—Case recorded in the 35th vol. of the 'Med.-Chir. Trans.,' p. 65.—Mrs. B—, in December, 1842, was affected with hæmatemesis, vomiting a washhand-basinful of blood. During the succeeding forty-eight hours she lay in a state of total unconsciousness, the pulse scarcely perceptible. The vomiting did not return, and she slowly recovered. In the autumn of 1845 she complained of frequent sickness, pain in the epigastrium and in the left groin. A hard tumour was discovered in the left iliac fossa, which moved freely across the abdomen as she moved from side to side. The size and shape of this tumour were very much like an ordinary placenta, and imparted to the fingers the feeling of being very heavy. Nausea, occasional hæmatemesis, and constipation, were the symptoms most prominent in the progress of this case. In



October, 1850, the patient died. The stomach contained about a pint of semifluid matter, and felt very much like the crop of a fowl; the duodenum resembled a large sausage stuffed with lead. On cutting into the stomach it was found partially filled with some gruel-like fluid, and in the lower half an immense number of pins, of a purple-black colour, not corroded, varied in size, all bent or broken, many very pointed. The pyloric half of the stomach presented a remarkably thickened condition of the villous coat, being highly vascular and raised in rugous elevations, like the stomach of an ox. The weight of the pins contained in the stomach was nine ounces. An incision made into the duodenum displayed a mass of pins very tightly packed, of various shapes, similar to those found in the stomach, and wholly obstructing the tube. These weighed a pound, as nearly as could be ascertained.

When the pin or pointed instrument is large, more dangerous symptoms ensue, thus :

CASE 10.—Hildanus gives the history of a young girl, who swallowed a large pin, which remained in the stomach for three days without producing any symptoms, when intense pain set in at the seat of the pylorus, accompanied with acute fever, cerebral disturbance, and convulsions; the foreign body, however, was evacuated naturally, and she recovered.

CASE 11.—On the other hand, Schenklius mentions the case of a man who swallowed an iron needle, which by degrees pierced the coats of the stomach, penetrated the substance of the liver, and caused rapid death.

CASE 12.—M. Ferrus ('Acad. Roy. de Méd. Paris,' June, 1825) exhibited a stomach on the greater curvature of which, near the pylorus, was found a pin of an inch in length, the point of which came out across the external coat of the viscus. Nothing had occurred during life to cause any suspicion of the presence of this extraneous body, which appeared, however, to have been making its way for some time through the parietes of the organ, and to have penetrated towards the superior part of the œsophagus.

CASE 13.—Riedlinus (*'Lineæ Medic.'* ann. 3, Januar., Obs. 3) relates a case of a lady who, in using a fork of which one of the prongs was nearly broken off, and after putting a piece of meat in her mouth and swallowing it, was surprised and alarmed at finding the prong wanting. She had pain in the œsophagus, which continued to increase and pass downwards as the foreign body descended. She continued her repast, and the more she ate the more the pain diminished. On the following day she consulted Riedlinus, who ordered her an emulsion of sweet almonds, which was continued for several days, and which allayed the pains experienced. The piece of the fork was evacuated at stool, and she recovered.

Fragments of glass, crystal, diamonds, or other irregular bodies, may not cause any very unusual symptoms, yet Hildanus reminds us that some royal guards had a debauch of wine, and broke the glasses with their teeth; they swallowed the fragments, and perished very shortly afterwards. On the other hand, Lusitanus (*'Schol.'* Cent. 2, curat. 69) details the history of a man who ate with pleasure leather, fragments of glass, and earthenware, without inconvenience. Even Hildanus gives us an exactly opposite result to his former observation, by assuring us that he knew of three persons who, at a feast, broke several wine-glasses with their teeth and swallowed them, and no ailment occurred, for all three lived to an advanced age. Shoe-buckles, as worn in the olden times, have been swallowed.

CASE 14.—Thus, M. Puzos relates the case of a boy who swallowed one, but passed it on the following day without the slightest pain. Again,

CASE 14A.—M. Rivals records the case of a little girl of five years of age who swallowed a shoe-buckle, and who was seized with great pain in the stomach, which continued off and on, with at times violent colic, for a period of nearly two years, when a tumour about four fingers in breadth appeared in the right hypochondrium. Emollient applications were used for fifteen days, when she was suddenly relieved, and the tumour entirely disappeared, at the same time passing a

large evacuation of purulent matter by stool. She entirely recovered, but the buckle was never found. He saw her about ten to thirteen years afterwards, and she was in perfect health.

CASE 15.—The lid of a small iron box, about the size of a twenty-four-sous piece, had been swallowed by a child of four years old, as related by Mackins; it stuck in the œsophagus, and ineffectual attempts were made to extract or push it into the stomach. About half an hour afterwards it passed into the stomach, and in its passage along the intestinal canal it excited great pain, convulsions, &c. On the fifth day, at stool, the lid appeared, and it required much force to extract it. Large quantities of blood followed, and continued so for a few days.

CASE 16.—*Wooden box.*—In the ‘Dict. des Sciences Médicales’ is the case of the notorious Tarrare, as related to the National Institute by M. Percy. Before his enlistment the man was in the habit of devouring enormous quantities of the coarsest flesh, fruits, and roots; and subsequently he was found, after swallowing his own rations, to feed on the refuse of his comrades’ messes, or offensive meat thrown on the dunghill, and to devour cats, dogs, and serpents. M. Fournier tells us that, at seventeen years of age, when he weighed only 100 lbs., he could devour in the space of twenty-four hours a quarter of beef as heavy as his body; and that on one occasion, when in the army, he devoured in a few minutes a dinner prepared for fifteen German labourers, and composed of various substantial dishes. There is a singular story, that the French commander attempted to turn this wonderful voracity and extent of stomach to a good account, by employing it as a safe deposit for a letter of secrecy which he wished to send to a French officer at that time in the hands of the enemy. He sent for the man, showed him a wooden case containing the letter, and having put him into a good humour by treating him with thirty pounds of liver and lights, prevailed upon him to swallow it, and to depart with all speed to the enemy’s quarters. Tarrare, however, was taken prisoner in the attempt, and while in prison passed

the box by stool, before he could meet with the officer, but immediately swallowed it again, to prevent it from falling into the enemy's hands. He was strongly suspected of cannibalism, and was often repulsed with difficulty from the ward appropriated to the dead. He at length fled from the army, in consequence of a rumour that he had devoured a child sixteen months old, which had suddenly disappeared. The alvine evacuations of this man were not immoderate; but after gorging his stomach he slept and emitted torrents of perspiration, a symptom common to the disease. He fell at length into a hectic, and died of marasmus." (Good's 'Study of Medicine.')

3. *Elongated and cutting* bodies, such as knives, steels, blades of knives, point of sword, awls, scissors, &c. These may be swallowed accidentally, as in the case of jugglers, who perform their feats of pretending to swallow different kinds of instruments, and by mistake suddenly allow the body to escape from their grasp; others, again, intentionally swallow knives, &c., &c., as a means of procuring a livelihood or creating a sensation. Generally speaking, it is the insane individual who is so prone to swallow hard and irregular substances, and of which cases so many are on record.

CASE 17.—*Flute swallowed*.—A young man who was playing on the flute received a blow which forced the instrument into the throat, in a manner that it could not be seized before it glided into the œsophagus; it rested there a short time, when it fell into the stomach, where it was felt in the right side. This flute for three days caused great pain, and prevented his eating, drinking, or sleeping; at last, it threaded through the intestine, and passed out of the anus. Case reported in full length by Stalpart Wander-Wiel (Cent. 1, Schol. Obs. 21), and by Bartholinus (Cent. 1, Histor. 69), who gives a figure of the flute, of its natural size.

CASE 18.—*Pieces of wood*.—In the 'Actes des Médecines de Berlin' (decad. 2, vol. iv, Obs. 11, p. 79) is the examination of the body of a criminal who had been hanged. This man had swallowed, about two months before, *seven pieces of wood*, in order to cause death. These pieces were broken irregu-

larly, and had points capable of piercing and tearing the parts. One of them was four inches and a half long, and three quarters of an inch broad; however, this man was in good health before his execution. In his stomach was found the seven pieces of wood, the one on the other, chiefly on right side; no impressions were apparent on the coats.

CASE 19.—*Langius*.—A peasant who swallowed an oblong pointed piece of wood, four knife-blades, and two pieces of iron of irregular form, was so tormented with pain in hypochondria, that he committed suicide. All were found in stomach.

CASE 20.—*Blade of sword, knives, &c.*—Tyson ('Boneti, Medic. Septent.,' lib. iii, "De Œsoph.," sect. i, c. 19) gives the history of a juggler, named Lichard, who swallowed in the presence of several English seigneurs the *blade of a sword* an ell long, which he previously broke in several pieces; some time after that he swallowed before the King of England *two knives and a razor*. The king, who thought there was some fraud, ordered his hands to be tied behind his back, and he himself put one of the knives in his mouth; these instruments were passed by stool three days after.

This same Lichard swallowed, besides a great number of foreign bodies, such as flint stones, pieces of silver and copper money, keys, sticks, &c., also two knives, one of which was shut in its sheath, and was nine fingers' length long; both passed by stool on ninth day. His symptoms were a few lancinating pains, followed by nausea and vomiting.

CASE 21.—*Point of sword*.—Ambrose Paré (lib. xxv, cap. 16) says that a juggler swallowed the point of a *cutting sword* about three fingers long, and that he passed it by stool twelve days after, but it produced severe symptoms, and was passed with difficulty and in very great pain.

Montuus (lib. i, tom. 3, 'Anasc. Morb.') relates a nearly similar case. The blade of the *sword* was nine inches long.

CASE 22.—*Knife*.—Wesenerus ('Act. Leypsicus,' ann. 1692, p. 502). A young peasant, æt. 16, accidentally swallowed a knife,

6½ inches long, with a hart's-horn haft, which descended to the stomach. At first he had acute pain in left hypogastrium, which disappeared and recurred at intervals. About a year and a half after, an inflammatory tumour appeared at that part, which suppurated and was opened, when the knife presented itself by its point, the wound was widened, and the knife extracted; a speedy recovery ensued.

CASE 23.—‘Philosoph. Trans. Roy. Soc. of London,’ 1696. A man servant complained of a pain and hardness in the right side, which had continued more or less for twelve years, and was observed approaching daily nearer the skin. An incision was made, and a rusty broken needle, which he thought he had formerly swallowed, was with difficulty extracted, after using some violence.

CASE 24.—Verdue (‘Pathol. Chir.,’ tom. ii, p. 30). A vine-dresser, æt. 65, strong and robust, whose reason was totally disturbed, swallowed a steel used by butchers to sharpen knives, and made no complaint; at end of five or six months a large abscess formed in right hypochondrium; opened, and steel extracted; wound healed in eight days. This same man swallowed the leg of an iron pot, and did not complain. Six months after, abscess formed in left hypochondrium, opened, and foreign body evacuated; speedy cure. Soon after this he again swallowed a pocket knife; this made its exit after some months by an abscess, which formed a little above and to side of lumbar vertebræ.

CASE 25.—*Scissors*.—Langius (‘Zodiac. Medic. Gall.,’ 1680, Obs. 8), relates that an epileptic swallowed some pointed *scissors*, four inches long and more than two inches broad, and were passed on the ninth day, without his suffering the least inconvenience.

CASE 26.—*Fork*.—Le Gendre (‘Journal des Scavans,’ 1716). Case of Spanish officer who swallowed a fork by accident; complained of dull pain and weight in stomach for a month; then had nausea for a short time; subsequently had occasional pains at different parts of the abdomen; nausea and tenesmus. A fixed and considerable pain in left iliac fossa

next occurred, and lasted two months, accompanied once with passage of clots of blood. Next had acute pain in right iliac fossa, and with much fever and blood per anum, so as to bring him exceedingly low. Recovered and gained flesh; his usual health re-established, with occasional passing pains in right and left loins. Fifteen months after accident had sharp pains in left groin, accompanied with serous, bilious, purulent dejection, lasting for twenty-five days, when the fork was voided per anum. The fork was silver, but was black and rough, and had lost its weight.

*Spoon.*—Plater (Cent. 3, lib. ii, cap. 6). Case of man who swallowed a spoon, followed by cutting pains in stomach, but was passed on following day in the stools.

CASE 27.—Maniac, swallowed nails, pieces of wood, flints, blades of knives, which he broke between his teeth; shortly after had severe pains and torments over whole interior, followed by spitting of blood, dyspnœa and fever; great pain in right groin, where there was a swelling; died in a marasmus after long diarrhœa. On post-mortem, suppurative peritonitis; in right groin, at commencement of colon, collection of pus and fragment of knife; another found in rectum near anus. (Sepulcretum, Boneti 'Anat. Pract.')

CASE 28.—M. Fournier ('Dict. des Sciences Médicales') relates another most extraordinary case, that if it had not been most unexceptionably attested, it would not have been credible. A galley slave, affected with depraved appetite and great voracity, and who was disordered in his intellects, fell at length a sacrifice to a colic, accompanied with a cough, and on opening him the stomach was found to occupy the left hypochondrium, the lumbar and iliac regions of the same side, and to stretch down into the pelvis. It was of a long and square form, and contained the following substances—a piece of stave, *nineteen inches long* and half an inch in diameter; another piece of the same, eight inches long; ditto, six inches long; twenty-two other pieces of wood, of three, four, and five inches in length; a wooden spoon, five inches long; the pipe of an iron funnel, three inches long and one in diameter; another piece of funnel, two and a half inches long; a pewter spoon,

entire, seven inches long ; another, three inches long ; another, two and half inches long ; a square piece of iron, weighing nearly two ounces ; various other articles, among which were nails, buckles, horns, knives, &c., the whole weighing about twenty-four ounces avoirdupois. So that the stomach of this unhappy being became gradually enlarged into a warehouse for all sorts of marine stores, as the term is applied in the present day. (Dr. Mason Good's 'Study of Med.')

CASE 29.—In the Museum of Guy's Hospital is a Preparation 1894<sup>76</sup>, and thus recorded :

Blade of a knife passed per anum, fourteen days after having been swallowed, by a child eight years of age, whilst running ; for two days it led to distressing symptoms of irritation about the stomach and œsophagus, increased by attempts at vomiting ; these subsided on the third day, and no further annoyance was experienced.

Presented by Dr. B. G. Babington, with a letter accompanying it, dated November 22nd, 1840 :

" Mr. John N— (now a middle-aged man, but then a child in his eighth year, at school at Reigate) was, during the last week of October, 18—, engaged with some schoolfellows in cutting sticks out of a hedge for a bonfire, when the farmer to whom the hedge belonged suddenly made his appearance, and put the whole party to flight. Little N— had a screw-penknife in his hand, the blade of which he unscrewed as he was running along, and on coming up to a gate, over which he was obliged to climb, he put the blade in his mouth, that he might have the better use of his right hand. Being out of breath at the time, in one of his laboured inspirations he accidentally drew in the blade to the back of his fauces, and then involuntarily swallowed it. At first it stuck by the way, and what with his alarm and his efforts to get it back again, he describes himself to have been thrown, for a moment, into a state of excitement bordering on convulsions. In a few seconds, however, it became dislodged and went down. When he reached the school the accident was not believed by the master, but some blood which appeared about his mouth, and an incessant cough, soon removed all doubt, and a medical man, Mr. Martin, was sent for. This gentleman ordered castor-oil in repeated doses, which



not only acted on the bowels, but caused much nausea and even vomiting. The knife was swallowed on a Friday, and on the Monday morning following, during a fit of retching, the blade seemed to be thrown upwards, and produced a very painful, pricking sensation, as if it were lodged and sticking under the right ribs. Incessant cough supervened, and blood was expectorated for three days, during which time the boy remained in bed in an upright position, which he did not dare to change, for fear of bringing on increased pain. For these three days he took no nourishment whatever, and did not venture even to swallow his saliva. In the course of the night of the third day the knife was again dislodged, and seemed to pass downwards, and from this time until its passage by the bowels, fourteen days after the accident, it gave him no uneasiness."

Dr. Babington remarks—"This is the substance of an oral account of the accident as given me by Mr. John N— himself. The case is not without interest, as showing what sharp and apparently lacerating substances will, nevertheless, pass through the alimentary canal without producing any permanent injury."

CASE 30.—The celebrated case of the knife-eater who died in Guy's Hospital, and whose case has been fully reported by Dr. Marcet, in vol. xii of the 'Med.-Chir. Trans.\*' The original documents are still in the Museum of Guy's; but as they are much worn, we have made a true copy of the manuscript, and have inserted such further details as furnished by Dr. Marcet. We commence by giving a verbatim copy of the original description, as written by himself, and found in his pocket after his decease.

"John Cumings 32 Years of age was in the month of June 1799 in France. Upon Sunday afternoon he and a Party of Shipmates went out to the Country 2 Miles from the Town of Havre Grass where upon their—Approaching a Large Field—observed a Great Number of men and women Standing and a

\* Visitors to the museum have often requested a perusal of this case, and as there is no other authentic description than that in the twelfth volume of the 'Transactions,' which is sometimes difficult for them to procure, it has been deemed advisable to introduce the case in the 'Reports,' so that it may be always referred to on the spot.

Large Tent That was Placed upon the Ground—Being anxious to Know What they Had been about Steard their Course Towards the Place where the P— Multitude Stood By Enquiring of the first they met With was informed it was a Play—Dirickly they Collected a Liver a Man—Who entered Inside the Scenes—they had a Ful View of the Performance but by Observing the Play Actors Swallowing Knives Induced Him to try the experriment that Night—They had been Time Enough on Board where they Begin To Enjoy the Former Part of the Night as Follors—after Drinking Verry Hard One of the Company oppened the Story Concerning the above Play Actors wich he Repeats that it was an Extrordinary affair to Swallow Knives—the author made Answer Dirickly and Told them that He Could Swallow Knives as Wel as they Could—the Company Present took Notice of the above answer Dirickly being made so Quick and for the Currisity of the Circumstance made a Serious enquiry if he was man enough to Perform what He allready Stated—he did not Like to Go against his Word Neither Did he Like To Take the Job in Hand—but by Having a good Suply of Grog inwardly he took his own Pocet Knife and Tried it first wich Sliped Down His Throat with Great ease and by the assistance of Some Drink Conveyed it into his Stomach—but still the Spectators Semed not Satisfied with one but made Further enquiry if he Could Swallow any more—he Replied All the Knives on Board of Ship—by this answer there Was 3 more Knives Presented on the Table, wich he swallowed in a few Minutes the same Way as the Former and by This Bold attemp of a Drunken Man the Company was wel entertained for that Night—Next Morning Nature Worked him to a Stool but Passed Nothink extrordiniary—at 4'O Clock the same afternoon he Had another When he Passed 1 and what was more Surprising to Him that was not the first Knife he swallowed—the Next Day he passed 2 at once and 1 of them was the first Knife he swallowed—the 4th he never knew any thing about—wither it Remained in his Bowels, yet he never Suffered by them that Time and was Safely Delivered without any assistance from a Surgeon and Shortly afterwords Took his Departure from France and never Thought on Swallowing any more Knives after for the space of 6 years—after wich yo see as follows.

“ Boston 13 of march 1805 was in Company where he gave his

Report of his Success in Swallowing Knives in France June 1799—2 or 3 of the Company Told him Plain to his face that it was Impossible for any man to Do Sutch a Thing and that it was Nothink but false Report—Wich he took verry Highly affronted—but after Considering a Short Time told the Company that he was the Same man Still and if it was agreable that he Should Satisfy their Curriosity—one small Knife was Presented to him wich he swallowed Instantly—in the Course of that Night he swallowed 5 More wich made 6 in all—this uncommon Report Soon Came to a Head in the Neighbourhood as he Had next morning a Thousand Visitors but he Gave very Few Admitance—it Hapand in the Course of that Day that he had Swallowed 8 more and 6 in the Night Before—Wich made 14 and that was the 14 of the month—as he had swallowed a Knife every Day the Month was Old—next Morning being 15 of the month as he was Taking verry Ill with Constant Vomiting and Pain in his Stomach Was Brought to Charlston Hospitol and betwixt that Period of Time and the 28th of the month following was Safely Diliverd of his Cargo and the whole of Them are Pressented in the Infirmary of that City—Upon the 29 he shipped Himself on Board of a Brig Bound to france where he Left that Brig and Shipped on Board of the Betsy of Philidelphia—in there Passage to america was taking by his majestys Ship Iris of 50 guns and sent into St. Johns in Newfoundland where she was condemed and Some of the Hands was Prest—being a Few months Laying there got Orders to sail for england—after 25 Days Passage made Land and Come two at Spithead—being there for some Days Got on Board Fresh Provisions of all kinds and ammonst that Plenty of Spiritous Liquors—after Drinking very Hard he Told of his success in Swallowing Knives in france and amerrica—None of his shipmates Would give Credit to his History wich Some Body Present was unhumane Enough to offer Him a Knife—upon Disdaining to be worse than his word he Proceeded imiately to Perform his Part of the Business that Night being the 4 of Dec<sup>r</sup>. 1805—in the Course of the Night he swallowed 5 knives—next morning being the 5<sup>th</sup> Day of The Month The Ships Company was anxious for to see the Performance Renewed the Second Time—by the Encouragment of the People and the Assistance of Good Grog his Lot was

Ordained to be Miserable Hereafter—in Consequence of the Same he Swallowed 9 that Day to his own Knoledge and the Spectators informed him afterwards than he Swallowed 4 More that he Knows Nothing about—they have been all Clasp Knives and some of them very Large ones—upon the 6 of Dec<sup>r</sup>. he Was under the Nessity of applying to a Doctor who was Surgeon of the Ship and the Doctor Finding that he was in a Bad Situation made a Strick<sup>d</sup> Enquiry of the Princible Men that was Eye to the Transaction wich the Captain and the Rest of the officers found To be a True Story—the Surgeon indeed Never Neglected to pay the greatest attention and Descriable what medicines he Thought Proper towards his Relief but all to No effect—at the Expiration of 3 months by Taking a Quantity of Oil he found them Dropping Down his Bowels—in a Few Days he was able to walk to any part of the Ship and in that Continuance till the 4<sup>th</sup> of June following when he vomited one side of the Handle of a Knife marked Cunningham the same it belong to—for Tope in the same ship—and by asking him if he knew any thing about such Knife he Dirickly confesd that it was Part of the knife Cummings swallowed of his—the surgeon keeps the said Piece in his Possession—4 months Pasd without any Thing Hapening—on the 4 of November he Passed another Piece the same as the former with the Lining of a Knife allong with it—2 months Passed—During that month he Passed 4 more Pieces and since they nothing Extraordinary Came away from him—June 12, 1807 he was Discharged in Consequence of his Complaint and Likewise being at the Survey unserviceable was admitted into Guy's Hospital—a Great many never Bilived that Circumstance—after 5 Weeks was Presented out and was in his Lodgings for the space of 5 weeks but by finding himself Getting worse was Readmitted.”<sup>1</sup>

The following is the medical testimony :

Dr. Lara, Surgeon to H.M.S. Isis, thus writes :—William Cummings, æt. 29, a seaman belonging to H.M.S. Isis, was reported “sick” to me, on the 6th of December, 1805. He complained of excessive pain in the stomach and bowels, incapacity of retaining anything on the stomach, and severe pain in standing and walking erect. These symptoms he attributed to having swallowed, during the three preceding days, nineteen or twenty

<sup>1</sup> Here the MS. ends.

pocket-knives, and one paper-knife case; the latter he stated to have been presently returned, but all the former retained. Incredulous of this statement, I made every possible inquiry; and on the evidence of those who solemnly declared they witnessed the fact, the number of knives actually taken into the stomach appeared to be fourteen. The greater part of these knives were nearly four inches long, and full one inch in their extreme breadth. He did not apprehend any attendant danger, as he had (he said) a few years previously swallowed eighteen knives at Boston, in America, of which he got rid in four days, without the least inconvenience. He complained of great pain, and had urgent vomiting, which immediately occurred on his sitting up or swallowing anything solid; this became less frequent, but he became evidently emaciated; his appetite improved, and the symptoms continued more or less, and on the 6th of June he vomited up half a horn handle of a knife. He gathered strength and flesh, ate voraciously, drank proportionably, and performed various easy duties in the ship, though, when questioned, he complained of pain when standing erect, and of vomiting at intervals. On the 8th of November, 1806, he passed, in two alvine evacuations, the blade and half the horn handle of a knife; and on the 12th he passed another portion of iron.

Mr. Kelly now succeeded to the Isis, and he wrote to Dr. Lara on 23rd of January, 1807, to say that Cummings had passed, in the early part of the month, the iron portion of the handle of a knife. In May, 1807, he again writes that Cummings had passed several pieces of iron, one of which had excited extreme pain, from its having laid transversely in the rectum; and that one piece, with a hook-like end, had been ejected from the stomach with excruciating pain, and hæmorrhage to the amount of two pounds of blood.

Dr. Lara concludes:—"I have only now to add, that of the portions of knives expelled I have six pieces of iron and two of horn."

In communicating with Dr. Curry respecting this case, he writes as follows:—"Anxious to give every possible illustration in my power of William Cummings's extraordinary case, I have thought it more satisfactory to send you the portions of knives voided by him, rather than a sketch of them (see Guy's Museum, No. 1894<sup>81</sup>). I observe in your letter that you call Cummings 'John'; his name was 'William.'"

In June, 1807, he became a patient of Dr. Babington, in Guy's Hospital, and the following entry is thus recorded:—John Cummings, June 18th, 1807, under Dr. Babington, in Job Ward, and was ordered, on June 19th, Pilul. Hydrag.  $\mathfrak{Oss}$ , o. n.; Mist. Oleosa c. Manná; and on July 10th, Pilul. Galban. co.  $\mathfrak{Oss}$ , ter quotidie, ex Inf. Quassiæ  $\mathfrak{Ziss}$ .

He was presented on the 22nd of July, his story appearing altogether incredible.

On the 19th of August, 1807, he was readmitted, under Dr. Babington, and ordered, the same day, Inf. Rosæ c. Magn. Vitri. His health had evidently become worse. On the 21st he was ordered Inject. ex Infus. Sem. Lini, o. n.; and on the 24th to take Acidi Nitric., gr. xv, ter quotidie. On the 28th of October he was presented in improved health.

He did not appear again at the hospital till September 28th, 1808, when he was admitted under Dr. Curry, under whose care he remained, gradually and miserably sinking, till March, 1809, when he died in a state of extreme exhaustion. Dr. Curry thus details the case at this period:—"A sailor, æt. 32, was admitted under my care, stating his complaint to be severe and constant pain of the belly in general, but especially of the lower part, arising from his having, about three years before, swallowed, while in a state of intoxication, a number of common pocket-knives. Accustomed as we are in large hospitals to the bold and well-managed impositions which are occasionally practised by the idle and unprincipled of both sexes, in order to obtain exemption from labour and commiseration of suffering, I confess that at first I felt very incredulous to his story; but as several of the pupils present at the admission recollected his having been in the hospital on two former occasions, under the care of my friend and colleague, Dr. Babington, and observed that the account which he now gave exactly accorded with his former one; and as there was, besides, an appearance of unaffected simplicity and truth about the man, I was unwilling to show any further doubt on the occasion, but fully resolved to watch and investigate every circumstance of the case in such a way as might detect imposition, if attempted, yet not wound the feelings of an honest mind, if the narrative were true. Indeed, the proper mode of proceeding in such cases forms a very important lesson of

instruction to pupils in general, but is particularly so to those who are destined for the navy or army, where, on the one hand, such frauds are often practised to get invalidated, and where, on the other, men may be severely punished, by confinement or flogging, for an uncredited act of folly, which entails a life of wretchedness upon the unfortunate person who commits it.

"I ordered this man, accordingly, Magnes. Æss, Carbon. Potass. Æss, ex Julep. Menthæ ʒiss, ter die; Opii gr. j, o. n. (He continued this mixture till the 17th of October.) I merely directed that his stools should be preserved for our inspection. The first fæces appeared of an inky blackness, such as they always are where persons are taking largely of any chalybeate medicine; but as this might possibly be accidental, as it might also depend upon his swallowing ink with a view to deceive, or proceed from his having taken into his stomach portions of iron in some smaller and less dangerous form than that of clasp knives, I ordered that every stool should be saved and examined, in expectation that this appearance would be found to vary considerably, if the former were the case; or that we should find some of the pieces of metal, if the latter were true. A week or more having passed without the least change of colour in the stools; finding him, too, as often as I came, almost always lying on the bed, with his knees drawn up—" (The manuscript here abruptly ends, the continuation having been lost.)

The following prescriptions are entered thus :

September 29th. Ol. Ricini. 30th. Acid. Vitriol. dil. gutt. xl, ex Dec. Avæ cras mane, horâ octavâ injiciantur. October 1st. Repet. enema. 3rd. Repet. enema quotidie. 7th. Utatur injection. bis quotidie. 17th. Mist. Olei (Sem. Lini) c. Tr. Rhei ana ʒij o. n. 31st. Episp. scrobic. cordis ampl. November 18th. Hirud. iij, part abdom. dolenti, enema commune statim; Opii gr. iss post bi-horium si dolor permanserit. December 9th. Hirud. iv, scrob. cordis. 16th. Episp. scrobic. cordis. 25th. Calom. gr. iij, c. Opii gr. j, si necesse sit. January 16th, 1809. Hirud. vj, abdom.; Opii, gr. iss, c. Calom. gr. v, o. n. The mixture left off. February 10th. Hirud. viij, part abd. dolent; Enema commun. 20th. Cal. gr. ij, Opii gr. j, o. n.; Mist. Olei c. Tr. Rhei, p. r. n. Martii 3. Opii gr. iss, o. n.; Magnes. Alb., ʒj, ex Aq. Ment. ʒiss,

t. d. 6th. Tr. Gentian. gutt. x, ex Aq. Menth, piper. t. d. 10th. Opii gr. ij, o. n.; contin. haust. 13th. Enema ex Infus. Lini. c. Tr. Opii ʒj, stat.; Perstet in usu præscript. Martii 3. Repet. inject. quamprimum. Martii 19. Obiit.

*Post-mortem* examination by Mr. Travers, in the presence of the officers and other medical gentlemen.—Throughout the cavity of the abdomen a blackish, ferruginous tinge prevailed, which was also observed in the hepatic system. On examining the intestines, one of the blades and one of the back springs were actually found in them, both so situated that their expulsion from the body was obviously impossible. The latter of these, about four and a half inches long, had literally transfixed the colon opposite the left kidney, and projected into the cavity of the abdomen, while another was found stretching across the rectum, with one of its extremities actually fixed in the muscular parietes of the pelvis. It was observed that, although the knives had thus perforated the intestines, no fæces had escaped into the cavity of the abdomen, and that no active inflammation had taken place, in consequence, no doubt, of the perforation having been gradual, and of a slow and simultaneous process of ulceration having taken place from within, which had enabled the parts to adapt themselves so closely round the protruding instrument as effectually to prevent all communication between the wounded intestine and the general cavity of the abdomen.

The stomach, viewed externally, bore evident marks of altered structure. It was not examined internally at this time, but was opened soon afterwards in the presence of Sir A. Cooper, when a great many portions of blades, knife-springs, and handles, were found in it. These fragments were between thirty and forty in number, thirteen or fourteen of them being evidently the remains of blades, some of which were remarkably corroded and prodigiously reduced in size, while others were comparatively in a state of tolerable preservation (see Guy's Museum, No. 1894<sup>80</sup>). There were also portions of the springs and linings, the metallic lining of a handle, silver ornaments of a handle, a uniform lieutenant button, &c.\*

Prep. 1800 shows the enlarged and thickened stomach of the sailor J. C., who had swallowed clasp knives. The œsophagus,

\* A plate accompanies Dr. Marcet's paper, in which the whole of these fragments, &c., are very carefully engraved.



at its lower part, and the upper orifice of the stomach, were thicker than natural. The left extremity of the stomach, where the spleen adheres to it, had its usual texture; but the right was exceedingly thickened. The rugæ in the mucous membrane were unusually prominent, and there were granulated projections from the edges of the rugæ. This membrane was slightly coloured by the steel; the pylorus was natural, but the duodenum had a greater thickness than usual.

CASE 31.—Another instance is related by Dr. Barnes, of Carlisle, of a juggler, who, on the 17th of November, 1823, accidentally swallowed a table-knife with a bone handle; together nine inches in length. The account given by the man was that, “having offered for a small sum of money to swallow a table-knife, a new one was accordingly brought from a neighbouring shop. The method by which I pretended to swallow it was, to pass the handle and part of the blade down my throat, and hold the point of the knife fast with my teeth. When I was on the point of drawing it out again, some person, coming unexpectedly behind me, gave me a smart stroke on the back, the surprise of which caused me to lose hold of the point, and immediately the whole knife slipped into the stomach. I directly made very violent efforts to throw it up, but in vain, and the endeavours of the surgeon were equally useless.” The man immediately became very much alarmed, expecting instant death; attempts were made with the fingers and with long forceps to seize the knife, but it was far beyond their reach, and could not be felt on the external surface of the stomach. Next day he complained of pain in his stomach, for which he was bled, and a clyster given; and afterwards, having pain in the left shoulder, shooting across the chest to the stomach, he was bled again. Soon after the handle of the knife could be felt very distinctly by pressing gently on the navel, though slight pressure gave him considerable pain, but a single cup of tea or a little food of any kind distended the stomach so much that it entirely disappeared. Various suggestions were made, and among others gastrotomy, but the patient would not consent to it. He was able to walk about a little during the day, and could sleep at night on his back, but not on either side. He was frequently squeamish and sick at stomach, and sometimes felt a severe twisting pain in that organ. He kept quiet till 28th December, when he left on

his way to London, but died at Middlewich on the 16th of January following. From the account it is very evident that he never laboured under any urgent symptoms, and seems to have been worn out rather by terror and anxiety. "On opening the belly," Hadfield says, "my first attention being of course directed to the stomach, I found the knife beginning to protrude through a gangrenous opening, about two inches and a half from the beginning of the duodenum, on which part the knife had lain. After opening the stomach, I found that the point of the knife rested on that part of the greater curvature, almost exactly opposite to the cardia, and had likewise very nearly perforated the coats. . . . The handle of the knife was completely dissolved, the rivets had disappeared, and a considerable portion (at least one third) of the blade also. What was left appeared exceedingly rusty and black." This knife is in the Museum of the Royal College of Surgeons. In the same collection are some knives voided by a soldier in St. George's Hospital.

CASE 32.—The following case was reported in the 'Lancet' of 1852, and was one in which the propriety of gastrotomy was fully entertained and considered, and which has not been in the slightest degree alluded to in the text, so that we have therefore inserted the omission.

James R—, æt. 23, single; hairdresser; one month insane; second attack; admitted into the Peckham Lunatic Asylum November 4th, 1848. Is of middle height; somewhat full habit of body; countenance much confused; hair brown; eyes gray; pupils regular; head large, but not peculiar in form. Bodily he is stout; pulse 80, full; bowels costive; tongue furred. Mentally, much lost; when spoken to, makes a chattering noise, but giving utterance to nothing intelligible.

In January, 1849, had a slight attack of smallpox, of which he quickly got better. Up to the end of last year he varied but little either mentally or bodily; if anything, the mind became a little improved, but only for short periods together; he would again relapse. He would, however, always answer questions when put to him, and frequently was heard to say he wished to die. At times he was found to be in the habit of picking up gravel and pebbles, and putting them into his mouth.

December 23rd, 1851.—This day he told the attendant that he had swallowed the handles of two tinned-iron spoons, and gave up the bowls corresponding. When handled, the stomach was felt weighty and distended to the length of five or six inches below the false ribs on the left side, and upon deep pressure a sense of friction of foreign bodies was elicited. There was a body to be felt about the size of the ball of the thumb, and about four inches long, lying (apparently in the stomach) vertically to the left of the umbilicus, from the margin of the hypochondrium downwards. He complains of no pain at all, nor of the handling, but says he often has pain "like cutting his heart out;" says there is a "weight there (placing his hand on the epigastrium) which presses on his lights and intestines." He was placed in bed in the infirmary, and ordered rice diet and slops. When further examined in bed, it was found that the distended stomach was prominent on the left side, just above the crista ilii, and by change of posture of the patient, was successively found at a corresponding point on the opposite side, and resting above the pubis. It is obvious, through the relaxed wall of the belly, that there is a large collection of angular bodies (pebbles), besides other longer bodies which can be poised lengthwise between opposing fingers. His stools are of green-gray colour (stained by iron), are consistent and lumpy; on percussion, the liver and spleen appear of average size only, and nothing abnormal is felt in the belly, except this distended stomach. Tongue clean and moist; pulse about 75 to 80, rather soft. In conversation repeatedly on the subject, he persists that he swallowed the two spoon-handles on the 23rd instant; that he has repeatedly done so, the first time he did it being on November 1st; and varies in saying that he had altogether swallowed twelve, and (at another time) twenty-seven similar spoon-handles; also that he had formerly swallowed sand and pebbles as long as two years since, and has done so as lately as from two to three months back (he gives these dates by reference to concurrent circumstances), and that he did it to effect suicide, because he was detained there.

About this time it was deemed expedient to have a consultation respecting the propriety of opening the stomach and the removal of the foreign bodies. Consequently we were

called in to offer our opinion on the matter, and to perform the operation, if it was decided upon. The first question naturally suggested itself was—Had the man swallowed the twenty-seven spoon-handles, &c., such as he described? It was true that he gave up some of the spoon-bowls to the attendant, but this did not prove that he had swallowed the handles. The only evidence, therefore, that could be received was by means of manipulative examination. The patient was placed in bed and on his back, and being a very thin and spare man, a very easy exploration could be made, assisted by the occasional semi-flexing of the body. After a careful search a large mass of foreign substance could not only be felt, but heard rubbing against each other, and at times some of these could be grasped, and felt like the spoon-handles as described by him: these seemed to be collected together, and to lay in an oblique position, extending from the left hypochondrium to the right iliac fossa. We were all perfectly satisfied as to the presence of these foreign bodies. The second question was, Are these foreign bodies in the stomach, small or large intestines? As far as could be made out he had swallowed the articles about two months, and had suffered no very great amount of pain, so that it was considered that in all probability these had not passed the pylorus; on the other hand, the foreign bodies were detected extending down into the right iliac fossa, which rather complicated the question. However, after much debating, it was determined that the seat of the articles was most probably in the stomach. The third question was the main one—Should gastrotomy be performed or not? The argument in favour of it was the fact that several successful operations of gastrotomy had been performed for the removal of foreign bodies; on the other side, numerous cases were adduced of recovery after the swallowing of knives, &c., without operation. It was ultimately determined to abandon the operation, and to leave nature to her own resources.

December 28th.—Has had repeatedly an ounce of castor-oil, which has kept the bowels open twice or three times daily. Stools dark, greenish-gray, or black, costive, breaking down very easily on pressure; has had fluid food; pulse not disturbed, and tongue clean (not raw nor red); urine natural; appetite but small.

81st.—To-day, some complaint of pain and tenderness in the belly; some sense of fulness. The stools as before, but covered with a yellowish creamy substance, which floated strongly in flocculent flakes in the urine found in the close stools. At first the substance was conceived to be pus, but examined microscopically, showed to be composed entirely of fat or oil, with crystals of triple phosphate, animal-striped muscle, and vegetable hairs and epidermis, besides yellowish granular matter.

January 3rd, 1852.—This morning vomited his breakfast, consisting of tea and bread-and-butter, which was returned of an inky colour; but after standing some hours, became of much browner colour (from oxidation of protoxide of iron?); complains of no pain in the stomach. Last night slept well, and this morning appeared as well as usual, but immediately after rising became sick and vomited.

5th.—Yesterday, bowels shut up, and some sickness in the morning; no complaint of pain; pulse 90; tongue clean. Had an ordinary black draught to-day. Bowels but scantily open.

7th.—Yesterday, vomited after breakfast, but not to-day. Appears weak and low. Was yesterday put upon a mixture containing tincture of calumba and tincture of orange-peel, with an ounce of sherry twice a day.

9th.—Much about the same; no vomiting for three days past; tongue slightly furred, of a whitish colour; bowels need aperients every day or two. He takes castor-oil, with the best effect. Pulse about 90, rather weak and sharp; no tenderness of belly; the stools constantly watched up to this date, and no stones have passed; they are still stained blackish.

20th.—Has continued much about the same, some days refusing his food, in the morning having nausea and vomiting. Bowels act slightly; still the stools are of the same colour. Has a mixture of decoction of aloes and calumba, with orange-peel tincture, and changes of diet, so as to please his fancy as much as possible. Although very thin, is perhaps a little plumper than he was. Tongue always not at all affected; pulse 90 to 100; no evening accession of fever now.

February 2nd.—No change; apparently no stouter. The foreign bodies in the stomach are still felt as distinctly, and in the same way as before. Now and then he vomits a meal;

pulse still ranges from 100 to 110; mentally much about the same. Continue medicine.

March 5th.—No change mentally; bodily, perhaps, a little stouter than he was; appetite good; stools still ferruginous, otherwise the same.

23rd.—Half-past one p.m. Up to this period he continued much as at the last notice; if anything, he had gained flesh, and his general appearance had improved; his appetite was good; he slept well, and complained of no pain or inconvenience in the belly. This afternoon, however, about half-past one o'clock, whilst sitting out of doors in the airing-ground, he was suddenly seized with severe pain in the abdomen, which bent him double, and caused him to fall to the ground. He was at once put to bed in the infirmary, when he began to vomit, upon which a sedative draught was given. In the course of the afternoon he complained of occasional "spasms and colic" (as he termed it), and vomited a little two or three times; the belly, however, was by no means tender to the touch on moderate pressure. He lay chiefly on the left side, and was unwilling to be disturbed in any way. In the evening, about six p.m., the symptoms became worse, and he now complained greatly of pain in the belly, but chiefly in the left hypochondriac region. His countenance became anxious, and imbued with cold perspiration; the pulse very small and rapid, about 141; the pain in the belly on pressure, or on being moved, very severe. Eighteen leeches were now applied to the abdomen, followed by warm poultices; and two grains of calomel, with a quarter of a grain of opium, were given every two hours. During the night he became gradually worse, complaining of intense pain in the belly, and feeling as if he were on fire, moaning frequently and calling out for water.

At seven o'clock this morning (the 24th) he was found to be fast sinking, and at a quarter before nine he expired.

*Post-mortem examination seventy-eight hours after death.*—The general appearance of the countenance was calm and placid; the body somewhat thin and spare. Over the entire surface of the abdomen there was considerable dulness on percussion, but this in a much more marked degree in the left hypochondrium, extending to within an inch and a half of the left crista ilii, and about two inches in width.

*Caput.*—Upon removing the calvarium, considerable opacity of the membranes of the brain was observed, but this more especially upon the superior surface of the two hemispheres; the brain itself, throughout its entire structure, was apparently healthy; the ventricles contained but the usual quantity of fluid. *Thorax*:—On removing the sternum and cartilage of ribs, a patch of recently effused lymph, of the size of a crown-piece, was seen lying on the anterior convex surface of the right lung, about its middle; posteriorly, this lung was slightly adherent at its superior part; the structure of both lungs was quite healthy; the heart, if anything, was a little larger than usual, but healthy as to its structures. *Abdomen*:—On removing the abdominal parietes, the cavity was observed to be filled with a dark, greenish-gray fluid, with which a considerable amount of recently effused lymph was intermixed. The whole peritoneal surface was injected, of a deep-rose colour. The stomach was seen lying in the left hypochondriac region considerably more vertical than usual, and apparently much contracted, and, together with the whole mass of intestine, with the omentum, was considerably engorged with blood. Upon pressing on the stomach, a hard mass, about five inches long and two wide, was felt lying in its long axis, and some fluid, of a dark, greenish-gray colour, was seen issuing from an orifice on the anterior surface of the duodenum, about an inch and a half from the pylorus, of a size to admit a swan quill, oval in shape, with sharp-cut edges. On feeling the duodenum, a body about five inches long, of the thickness of a quill at one end, and flattened out at the other, with the latter towards the pyloric orifice of the stomach, could be distinguished. The stomach and duodenum were now removed, double ligatures having been put on, and the space between them divided. An incision was now made along the lesser curvature of the stomach, when a quantity of fluid resembling that seen on opening the abdomen, and of a peculiar odour, poured out. A mass of handles of tinned-iron spoons, together with nails and other articles, were now seen closely packed together, the spoon-handles, for the greater part, lying with their flattened extremities towards the cardiac end of the stomach. On removing them, there were found to be thirty-one entire spoon-handles, of about five inches long; two half handles (flattened ends);

two half (thin ends); nine nails, varying in size from a garden-wall-nail to a spike-nail; rather better than the half of the iron heel of a shoe; one screw, of two and a quarter inches long; four pebbles the size of a hazel-nut, and one metal button, the weight of which conjointly amounted to two pounds eight ounces. The whole of them when first removed were stained of a black colour, but on exposure to the air became quickly oxidized. Many of the handles had become much thinner, and some acted on only in parts; others apparently unchanged except as to colour; a number of them show the fibrous texture of the iron, and have the angles at their extremities rounded off, or somewhat blunted. On opening the duodenum, an entire spoon-handle was seen in its axis, with its flattened extremity towards the pyloric end, and opposite the perforation above mentioned. The coats of the stomach were considerably thickened, and the mucous membrane presented a very hypertrophied and rugous appearance, and stained all over, of a dark greenish-gray colour; the duodenum towards its termination presented an appearance closely allied to that of the stomach, though not in so marked a degree; its surface being also tinged, of the same colour, and its coats thickened. The whole of the coats of the small intestines throughout its course were somewhat thickened and injected, more especially the mucous membrane, and scattered over its whole surface, in some places more thickly than in others, numerous papillæ were noticed, varying in size from a mustard-seed to that of a tare. The perforation in the duodenum was somewhat thickened as to its margins (internally), and not so sharp as the margins of it externally. This unfortunate occurrence was mainly due to the efforts of nature in getting rid of the contents of the stomach, for one of the spoon-handles had actually passed into the duodenum, and, in making the turn of the gut, its broken extremity became caught in the coats, and produced the perforation and death. Peyer's glands were apparently not to be met with. In the large intestine the solitary glands were unusually large and distinct. The entire lining membrane of the intestine was stained of the same colour as that of the stomach. All the other organs in the body were found healthy.

CASE 33.—A young Prussian peasant, feeling some un-



easiness in the stomach, attempted to excite vomiting by introducing a knife with the shaft downward into his throat. The instrument slipped from his fingers, and fell into the œsophagus. He attempted to dislodge it by placing himself head downwards, but failing in this, he finally washed the instrument into his stomach with a draught of beer. The surgeons of Koenigsberg, whom he consulted, advised him, in view of the dangers to which he was now exposed, to have the knife removed by an incision; and Daniel Schwaken, a lithotomist, was selected as the operator. About a month and a half after the accident, having been already prepared for the operation by a gentle purge, and by oleaginous and balsamic medicines, the patient was tied to a plank, and the course of the proposed incision was marked with a pen and ink over the left hypochondrium. The external incision was made longitudinally, to the extent of two inches. The stomach being empty at the time did not present at the wound, and the surgeon was obliged to seize and draw it outward by means of a curved needle. The projecting point of the knife was easily recognised through the coats of the stomach. An incision was made into the organ, immediately over the instrument, through which it was promptly extracted and found to be about ten inches long. The edges of the wound in the stomach required no sutures. The incision of the integuments was drawn together by five peg sutures (*chevilles ou agrafes*). No serious symptoms ensued, and the patient soon got well. The knife, and a portrait of the young peasant himself, says the report, are both preserved in the Electoral library of Koenigsberg.

CASE 34.—A young fellow of Prague, out of mere sport, says Crollius, swallowed a knife nine inches long, the point of which presented a little above the fundus of the stomach, towards its left side, and the handle towards the spine. Two months afterwards it was successfully extracted from the stomach by Florian Mathis, first surgeon to the emperor. Scarcely any symptoms.

CASE 35.—In 1635, Shoal (*'Chelius' Surgery,* vol. ii, p. 391) had an uncle who had swallowed a knife six and a half inches long, and had retained it about six weeks. A straight

incision was made through the left hypochondrium two fingers' breadth under the false ribs; the knife was removed, and the wound joined by five sutures. Tents impregnated with tepid balsam and a cataplasm of bolar earth; white of eggs and alum applied. The wound healed on the fourteenth day after the operation.

CASE 36.—A Prussian woman had the misfortune to swallow a knife seven inches long, which she had introduced into her throat to excite vomiting. At first it stuck in the œsophagus, but afterwards gradually descended into the stomach, where it remained three days without causing any pain. She afterwards felt pricking sensations, and very soon the point of the knife could be felt on the left side. The pains increasing forced her to seek advice. Dr. Hubner, of Rastembourg, to whom she applied, made an incision over the point of the knife in the left hypochondrium, on the eleventh day of the accident. He found that the blade had already pierced through the stomach, and had excited slight suppuration around it. The knife was withdrawn with a pair of forceps. Her cure was afterwards very prompt.

CASE 37.—Lady at Bordeaux, æt. 24. Small silver fork slipped into throat and descended into stomach. Here it remained for some months, hardly producing any symptoms; but at the end of this period the most violent vomiting came on, and soon brought the patient into a most dangerous condition. By the advice of MM. Delpech and Pages gastrotomy was performed by M. Cayroche; the fork was easily extracted, and within twenty days wound completely healed. ('Rapport des Trans. de l'Acad. roy. de Méd. de Bourdeaux;,' 'Lancet,' 1828—29, vol. i, p. 264.)

CASE 38.—Amongst the rarities in the Anatomy Hall at Leyden, there is preserved a knife ten inches in length, which was cut out of a peasant's stomach, who lived eight years after\* (Philos. Trans. Abridg., vol. iii, p. 91).

The following is a general summary of the foregoing cases :—

\* Query whether this is not the same as Case 33.

Case.	Foreign Bodies.	Sex and Age.	Result.	Remarks, &c.
1	Bits of string, cocoa-nut fibre	Lunatic, male, <i>æt.</i> 22	Died	Peritonitis; ulcer of stomach. Mass 4 lbs. weight
2	Hair and string	Female, <i>æt.</i> 18	Ditto	Peritonitis; ulcer of stomach. Large masses in stomach; tumour in epigastrium; vomiting
3	15 gold medals	Male	Recovered	No treatment
4	Crown piece	Male, <i>æt.</i> 46	Ditto	Vomited up one and three quarter years after
4½	395 pins, at different times	Female	Ditto	All passed out at different parts of body
5	Mass of stones	Lunatic	Ditto	All passed (seventy) per anum
6	Quantity of needles	Female, <i>æt.</i> 8	Ditto	Fifty passed per anum during twelve or fifteen days, five and six years after. Occasional pain; blood per anum
7	Several pins	Female	Ditto	Rejected six years after. Most acute and fixed pain in œsophagus
8	Ditto	Female, <i>æt.</i> 18	Died	In three weeks; great emaciation. Great pain; dysentery; convulsions
9	Quantity of pins	Female	Ditto	Eight years after; 9 oz. of pins in stomach; 1 lb. ditto in duodenum, obstructing gut. Pain; tumour in left iliac fossa; vomiting of blood
10	Large pin	Female	Recovered	Naturally evacuated. Intense pain; convulsions; cerebral symptoms
11	Iron needle	Male	Died	Rapid. Needle pierced stomach and entered liver
12	Pin one inch long	—	Ditto	No symptoms during life. Pin, &c., coming out through exterior coat
13	Prong of fork	Female	Recovered	Passed by stool
14	Shoebuckle	Boy	Ditto	Entirely recovered. Buckle never found. Great pain; colic; tumour in right hypochondrium
14a	Ditto	Girl, <i>æt.</i> 5	Ditto	On the fifth day appeared at stool, and extracted. Great pain in passage
15	Lid of iron box	Child, <i>æt.</i> 4	Ditto	Passed per anum, and re-swallowed. Died subsequently of marasmus and hectic
16	Wooden box	Male, adult	Ditto	

17	Flute	Young man	Ditto	Passed naturally. Great pain
18	Pieces of wood, to cause death	Criminal	Hung two months after	Wood in stomach; latter healthy. Health good
19	Piece of wood	Man	Died	Committed suicide, from intense pain
20	Blade of sword, knives	Male	Recovered	Passed after three days
21	Point of sword	Male	Ditto	Passed twelve days after. Severe symptoms
22	Knife	Young peasant	Ditto	Extracted one and a half years after from an abscess in left hypochondrium
23	Needle	Male	Ditto	Removed from an abscess in hypochondrium
24	Butcher's steel	Male, æt. 65	Ditto	Removed six months after from an abscess in right hypochondrium
25	Scissors	Epileptic	Ditto	Passed on ninth day. No pain whatever
26	Silver fork	Spanish officer	Recovered	Passed one year and four months after. Much suffering, &c.
27	Nails, wood, flints, blades of knives	Maniac	Died	Peritonitis. Marasmus, emaciation
28	Large staves of wood	Galley slave	Ditto	Large masses in stomach. Colic; cough
29	Blade of knife	Boy, æt. 8	Recovered	Passed on fourteenth day. Slight symptoms
30	Clasp knives, buttons, &c.	Sailor, æt. 52	Died	Exhaustion and emaciation. Lived some time
31	Table knife	Male	Ditto	Exhaustion and emaciation two months after. No urgent symptoms
32	31 spoon-handles, nails, &c. &c.	Lunatic, æt. 23	Ditto	Gastrostomy proposed, not performed. Perforation, peritonitis, &c.
33	Knife	Young peasant	Recovered	Lived five months
34	Ditto	Young fellow	Ditto	Gastrostomy
35	Ditto	Male	Ditto	Ditto
36	Ditto	Young female	Ditto	Ditto
37	Small silver fork	Female, æt. 24	Ditto	Ditto
38	Knife	Male	Ditto	Ditto

Having thus collected a sufficient number of cases, we may with safety enter into the consideration of the symptoms and diagnosis, as well as the progress and termination of these accidents, together with the prognosis and treatment.

The *symptoms*, as may be well observed, are exceedingly variable, and depending in a great measure on the size, form, and irregularity of the foreign body. In many cases it may be retained without inconvenience, and may pass on through the bowels without the slightest pain or trouble. But in general there is a sense of uneasiness and pain in the stomach, and if the body be large or heavy, it may produce a feeling of weight and fullness. Vomiting may next be excited, being an effort on nature's part to eject the unwelcome visitor; with these efforts a good deal of straining and pain in the epigastrium follows. After a time there is hæmatemesis, and sometimes the blood is of considerable quantity. Dyspepsia and all the uncomfortable forms of indigestion set in, requiring a very judicious and regulated diet to allay it in part. Should the foreign body be of iron, or any material partially soluble by the gastric juice, the contents will become stained, or the motions evacuated will be greatly discoloured. In perusing the cases, one cannot but be struck with the variety of the symptoms, all of which are due to acute and chronic gastritis, of a more or less intense form, and which give no evidence or clue as to the real nature of the complaint, except as to the statement of the person of having swallowed a foreign body.

The *diagnosis*, therefore, may be presumptive, or direct:—thus, of the former, the evidence would be as stated above, viz., the actual swallowing of the substance, the immediate sense of something wrong in the stomach, the subsequent pain in its region, vomiting, hæmatemesis, and discoloured stools: the direct or physical evidence is that of manipulative examination, where the substance can be readily detected through the parietes, and this is the only satisfactory method, and was adopted in Case 32. However, in many cases where the parietes are thick, it is quite impossible to employ these means, and no manipulation, undertaken even with the greatest possible care, will enable the surgeon to detect them. Again, where the foreign body has been swallowed some time, it is impossible to determine whether the foreign body, if felt, is in the

stomach or the arch of the colon; this was the case in the sailor knife-eater at Guy's Hospital (see Case 30). The following apposite remarks are made in Dr. Marcet's account of this case:

"His statement being at first altogether disbelieved, he was considered as a hypochondriac, probably labouring under some chronic affection of the stomach and liver, and was treated accordingly. Subsequently, however, the consistency of his story, the intense pain he suffered at the region of his stomach, and a hardness which Dr. Babington thought he could feel in the region of the colon, induced his medical attendants to give some credit to his account of the origin of his complaint; and Dr. Babington having one day examined him, conjointly with Sir A. Cooper, these gentlemen concluded, from a minute inquiry into all the circumstances of the case, and especially from the deep-black colour of his alvine evacuations, that there really was an accumulation of ferruginous matter in his organs of digestion. And this was fully confirmed soon afterwards by Mr. Lucas, one of the surgeons, who, by introducing his finger into the rectum, distinctly felt in it a portion of a knife, which appeared to lie across the intestine, but which he could not extract on account of the intense pain which the patient expressed on his attempting to grasp it."

*The Progress and Results.*—These are duly recorded in the cases, and are more especially detailed in Cases 30 and 32. The following is a general summary of the mode of expulsion and termination:

1. They may be vomited up.
2. They may escape into the intestines, and pass off with the fæces.
3. They may, as in the cases of pin-swallowing, traverse the organ, and appear at different parts of the body.
4. They may remain quiescent in the stomach for a long period, and the patient die of other causes.
5. They may cause gastritis, indigestion, impaired health, and slow emaciation, with exhaustion, terminating in death.

6. They may cause inflammation and adhesion of the stomach to the abdominal parietes, then produce ulceration and abscess of the parietes, which, when opened naturally or artificially, allows of the foreign body to be extracted. A fistula almost necessarily results.
7. They may cause inflammation and ulceration of the stomach, and become engaged in partly traversing the parietes, and then, from want of effort in repair, and from some sudden separation of the adhesions, may perforate the peritoneal cavity, inducing violent peritonitis, and death.
8. They may at once, from their sharpness, perforate the stomach immediately, inducing collapse and rapid peritonitis, such as is observed in ruptured viscera.

Of the thirty-nine cases recorded, omitting Case 38 as doubtful, there were twelve deaths and twenty-seven recoveries.

Of the twelve deaths, eight were males, three females, and one not stated; and of these, five died of perforation, five of emaciation and great exhaustion, one from obstruction, and one from suicide, owing to the intensity of the pain.

Of the twenty-seven recoveries, twenty-seven were males, who chiefly swallowed knives, &c.; ten females, whose luxury consisted in pins and needles; and in two the sex is not stated.

Of these twenty-seven cases the foreign body was vomited up in two; in one the pins passed out at different parts of the body; in one it remained quiescent in the stomach; in fourteen it was passed per anum, with various amounts of suffering and distress; and in five gastrotomy was performed, and without any fatal issue—they were all young people, about twenty or twenty-four, three being males and two females.

*Treatment.*—The following apposite remarks will introduce the subject of treatment, but, of course, must be acted upon with caution and discretion. For smooth and rounded bodies it seems appropriate. Mr. Pollock (Holmes's 'System of Surgery,' vol. ii, p. 467) says—"The swindler in the streets of London, in the habit of passing false coin, when detected in the act, will invariably endeavour to swallow the piece of money intended to have been passed, and will generally

succeed in the attempt, even if it be of the size of a half-crown. No evil effects occur in such instances. The treatment usually pursued by the man, in his own person, is peculiar, and not irrational. He avoids purgative medicine as worse than useless; on the other hand, he has recourse to a constipating diet, and feeds for some days on hard-boiled eggs and cheese, in excess beyond his usual diet. His theory is, that the more solid and copious the contents of the bowel, the more sure is the piece of money to be caught in the passing feculent matter, and thus will be most readily propelled onwards to the external outlet. It is believed that aperient medicine delays the expulsion of the coin."

There can be no objection to oily and mucilaginous drinks and food that is readily capable of digestion, and we must administer such remedies as may meet the ailments complained of in the way of palliative measures; thus dyspepsia, gastritis, hæmatemesis, intense vomiting, &c., may be combated by the usual remedies for the time. It is the successive attacks which lead to the emaciation, exhaustion, and death, where the foreign bodies cannot escape.

In Case 30 Drs. Babington and Curry prescribed dilute acids—first the nitric and afterwards the sulphuric—combined with opium and mucilage, with a view to dissolve the bodies, or, at least, in hopes of succeeding in blunting their edges. Various other palliatives were also occasionally administered; and that these remedies were attended with some temporary benefit may be inferred from the long period during which the patient's life was preserved, notwithstanding the utterly hopeless nature of his situation.

Berard, in allusion to the foregoing remarks, thus writes:—"On these points there is no difference of opinion; but not so respecting the operation of gastrotomy in those cases where a considerable foreign body has passed into the stomach, and has occasioned severe symptoms, and this body does not make its appearance externally by inflammatory thickening or otherwise. Must we, in these cases, rely upon the expectant treatment? Here death is often the result of such a plan. Must we hazard the opening of the stomach, draw the stomach through the wound, incise it, and, lastly, extract the foreign body? This is one of the most grave operations. What if



the foreign body had passed into the duodenum. I believe, however, that if the body be sufficiently large to lead to the supposition of its being in the stomach, and sufficiently irregular to fear the effects of its presence there, one ought to follow the example given by some practitioners, who, although not living in the time when limits were so placed that the boldness of the surgeon could not break through, have not the less put into execution, with success, one of the most hazardous operations which art has glorified to cure."

With regard to the propriety of performing the operation of gastrotomy, many points have to be first well weighed in the mind of the surgeon. Supposing he has full evidence that the foreign body has been swallowed, that he can detect the foreign body in the stomach, and that he is quite sure it is not in the duodenum or colon, and that the patient's life is in danger, he may then consider the warrantability for its performance. Let us for a moment review the nature of the different foreign bodies that have been passed successfully without any surgical aid—fifteen gold medals; seventy stones in a mass; fifty pins, about five or six years after swallowing them; nine ounces of pins in the stomach, and one pound in the duodenum, found after eight years' sojourn; a large pin; the prong of a fork; shoebuckles in two patients; the lid of an iron box; a wooden box; a flute; large pieces of wood; five individual cases of blades of knives and knives; a butcher's steel; a pair of scissors; a silver fork. Now observe the foreign bodies for which gastrotomy was performed, viz., one silver fork, and the remaining four were for single knives. The operation appears to have been performed in anticipation of coming evils, and, therefore, was executed on healthy persons, in the prime of life, capable of good repair, and previous to any complication of inflammation of the stomach, &c., hence the success.

Let us now review the deaths, and ascertain whether gastrotomy could have been useful. In Cases 1 and 2 the operation could not have been proposed, nor does there seem to have been any suspicion as to the real nature of the complaint. In Case 3, as in all the cases of pin swallowing, gastrotomy would be of little service, inasmuch as it would be difficult to extract such small bodies, and, on the other hand, these seldom cause death. In Case 11 the operation

would have facilitated death, as the iron needle had pierced the stomach and entered the liver; so also in Case 12, the point of the pin was coming out through the external coat. In Case 19 it might have proved useful, all things being equal. In Case 28 the perusal of the post-mortem appearance would show the difficulty of making up one's mind to extract such a mass. In Case 30 the man successfully passed many knives, and it was presumed he would do so still; the stomach had not ulcerated, and it is probable he would have recovered, had not one of the bodies perforated the colon and another transfixed his rectum, so that he died exhausted. Gastrotomy could not have saved him; indeed, it is probable the stomach would not have been reached, but the colon exposed, where the foreign body was afterwards found, and the substance got rid of, but without any relief to the contents of the stomach. In Case 31 the operation might have succeeded, and in Case 32 the operation was perfectly justifiable, had favorable circumstances been present.

On the whole, it appears that at present we cannot consistently recommend the operation; for the cases in which it was performed it was probably unnecessary, and the foreign body capable of natural expulsion. Of this more anon.

## II.—FOREIGN BODIES IN THE SMALL INTESTINES.

When a foreign body has passed through the pylorus, it has to overcome the horse-shoe coil of the duodenum, producing most intense agony where the substance is of an elongated form. It is here more or less liable to be arrested, but still in most instances it passes onwards, and there is then nothing to obstruct it until it reaches near the ileo-cæcal valve. However, it may become arrested in any part of its course along the small bowels, as may be observed in reference to the cases. Here, like as in the stomach, it may set up acute and chronic enteritis, may cause ulceration and perforation, inducing peritonitis; or reparative attempts may be made by a gradual proceeding inflammation and adhesion of the gut to the abdominal parietes, with subsequent ulcerative and

suppurative action, so as to determine the body to the surface, where it may be evacuated by the bursting or opening of the abscess. These reparative efforts generally take place in the iliac regions. Sometimes, however, the bodies may become impacted and obstruct the bowels, and produce all the symptoms of internal strangulation; when this latter takes place, it is almost impossible to ascertain the exact seat of the foreign body, in consequence of the great distension. With regard to intestinal concretions and gall-stones, as acting as foreign bodies and producing internal strangulation, space will not permit us to allude to such, so that we shall confine ourselves entirely to foreign bodies as introduced from without.

Many cases are on record where pins and needles, pieces of fish-bone, cherry, and other fruit stones, have become lodged in the intestines, and expelled by means of an abscess; some with success, and some terminating fatally, or ending in fecal fistula.

CASE 39.—A female, being surprised with a large and painful tumour of the umbilicus, consulted some physicians about it. After some time it broke of itself and discharged a great quantity of prune-stones; and notwithstanding all the care that could be taken of her, she died in about twenty days.<sup>1</sup>

CASES 40, 41, 42, 43.—Paré (libr. 25, cap. 16) relates the case of a shepherd who was forced by some robbers to swallow a knife half a foot long, the handle of which was of horn; it remained for six months in his body, and caused several unpleasant accidents, amongst others, severe pain in different parts of the body; he then fell into a marasmus, when an abscess formed in the groin; this was opened, and the knife extracted. Recovery very rapid.

Hildanus gives a similar case, where the abscess in the groin did not take place till the end of two years, when the knife was extracted.

Bartholinus (Cent. 6, hist. 99), where three pieces of pointed iron were swallowed by a madman, and which were evacuated by an abscess in the front part of lower belly six months after.

<sup>1</sup> 'Phil. Trans. Roy. Soc.' *op. citat.*

Diemerbroeck.—Case of child who swallowed a shoemaker's awl without its being known; had intestinal irritation, which was supposed to be worms. Some time after, something pointed was felt between the umbilicus and pubes. Incision made, point of awl seized, and there was extracted the iron of a shoemaker's awl. Recovery.

CASE 44.—Dr. White's case in the 'New York Medical Repository,' vol. x, p. 367, is interesting. George M—, æt. 26, became a patient of mine in May 22nd, 1806, with a rheumatic white swelling of the left knee; an exostosis of the left tibia, about two inches above the ankle, and with extensive ulcers on the anterior and middle part of each leg. The inflammatory symptoms progressed with extreme pertinacity, and on July 1st he seemed to be rapidly sinking, so that but small hopes were entertained of his exhausted powers withstanding any longer his extreme torture; an imperfect crisis, however, was unexpectedly formed, followed by a watchful delirium and an artful disposition to procure some instrument of death. Being unable to turn himself in bed, there was no suspicion of danger.

7th.—The night following this extraordinary change, he procured a full-sized teaspoon with some fruit jelly, and, impracticable as it may appear, forced it down his throat while his attendant was gone, at his request, to the opposite side of the room for water. His struggles were violent, and he apparently suffocating, when, by the force of his fingers against the handle of the spoon, he crowded it so far as to suffer it to pass into the stomach before his friends could be gained to give his attendant assistance.

In this deplorable situation I was immediately requested to visit him. He was greatly agitated, talked much, believed he had gained his point, and declared that no attempt of ours could rescue him, which, at the time, I considered too true. The morning following he had some irregular sleep, continued through the 8th under a slight delirium, and complained of no uneasiness of the stomach.

9th.—Continued the same until evening, when a spasmodic affection of the stomach alternated every fifteen minutes with a stupor, throwing himself, as often as the spasm returned,

with great violence from one side to the other, for about two hours (while the spoon probably passed the pylorus), when he suddenly fell asleep, and rested well through the night, extending the diseased leg, the flexor tendons of which had been greatly contracted, especially through the last complaint. He now became rational, his fever formed a perfect crisis, he recounted the past transaction with extreme sensibility, and expressed great anxiety for relief.

I waited the efforts of nature, assisting her with oily and mucilaginous substances, which served to remove the constipated state of the bowels, and to guard against any corroding effect of the metal. His ulcers soon healed, and he continued to gain in health and strength until the 25th, when a cutting sensation, confirmed by pressure of the hand when in a stooping position, led to a discovery of the situation of the spoon in one of the last circumvolutions of the intestinum ileum, near the line dividing the right iliac and hypogastric regions. It remained in this fixed position, with increased heat and irritation in the adjacent parts, until August 7th.

Fearing that any further delay might endanger success, and he being resolutely determined to suffer everything for relief, accompanied by the consulting physician I had recourse to an operation as the *dernier ressort*. I made an incision of about three inches parallel with the epigastric artery, extending upwards to near a transverse line with the top of the os ilium, penetrating the inner edges of the obliquus externus descendens, internus ascendens, and transversalis abdominis; opened the peritoneum with a lancet, protruded the lower turn of the intestines containing the handle of the spoon, with my forefinger; pierced the intestines with the lancet over the end of the handle, and extracted it in the same direction with the forceps. I then laid the divided edges of the intestine directly opposite, and secured them with the glover's stitch, dressing the external wound with slips of adhesive plaster and lint.

After this I made use of simple dressings to the wound; applied a liniment composed of camphorated oil, volatile spirits of ammonia, and laudanum, equal parts, to the diseased joint and limb, which became more painful and contracted while labouring under the irritation of the spoon.

Under this treatment his wound healed by the first intention, his knee became almost free from pain, and with the use of mild preparations of bark he was soon able to move on his crutches and ride abroad.

CASE 45.—Dubois ('Bulletin de la Faculté de Méd.,' t. vii, p. 517), extracted from an abscess in the iliac fossa the blade of a knife which had been swallowed for a long time.

CASE 46.—M. Otto ('Bulletin de Thérap.,' t. xv, p. 230) relates the case of a misanthrope who sought his death by various means, and ended by swallowing a teaspoon, which remained nine months in the intestinal canal, after which there appeared at the epigastrium a tumour. Otto recognised the site and extracted the spoon, which was scarcely altered. The patient recovered in a very short time.

The following cases comprise foreign bodies in the small intestines, where a previous hernia had existed.

CASE 47.—A—, æt. 60, afflicted with reducible scrotal hernia twenty-five years. Three months previous to death laboured under diarrhœa, which terminated in dysentery, from which he was partially relieved. Three weeks before death he had intense abdominal pain, vomiting, &c. The inflammatory action was diffused, and there was no particular uneasiness referred to the hernia. Leeches and antiphlogistics gave ease. One week after, these acute symptoms returned, with other signs indicating strangulation or obstruction, vomiting, hiccough, tension, &c.; the bowels however, repeatedly ejecting very scanty fluid evacuations. On examination, a small knuckle of intestine, deeply situated, was discovered; and could not be returned; operation was refused by patient. After further manipulation, the tumour with the intestine was returned to the mouth of the sac, after which stercoraceous vomiting ceased.

He sank gradually. He never made any allusion to the circumstance which was eventually proved to have been the essential cause of his disorder.

*Post-mortem.*—No intestine or omentum in the sac, which

was like a pulpy mass, and contained a small quantity of dark, grumous fluid. A fold of the ileum was adherent to the neck of the sac; the small intestines were much distended and discoloured; a hard substance projected through the coats of the intestine. This intestine was the cross fold of the ileum, and through its attenuated coats an earthenware egg-cup was found completely impacted, the bevelled and indurated edge of the cup resting on the spine; the broken stem of the cup, which projected through the bowel, was near the crest of the ilium. Immediately beyond the mouth of the cup, which was filled with liquid fæces and pointed downwards relatively to the course of the intestine, the ileum turned towards the left groin, where it formed the adherent hernia, and then again crossed towards the cæcum, the length of bowel between the cup and the cæcum being about ten inches. There was extensive adhesion between the two folds of the ileum and the peritoneum, about the mouth of the cup; ulceration having commenced through the coats from the cup to the groin, evidently indicating nature's process to dislodge the extraneous body. Whole course of large intestines healthy, and ilio-cæcal valves perfect.

Had there not been a hernia, the cup would probably have been passed per anum. The cup must have been introduced by the mouth. Small intestines distended; dilated pylorus.—'Lancet,' 1833-34, with a drawing of the cup.

CASE 48.—In 1722 the Académie des Sciences published that M. Farcy, surgeon de la Flèche, was called to a patient who for eighteen years had an inguinal hernia, which was easily reducible. All of a sudden it increased greatly in size, and was manifestly strangulated. A very great hardness, which seemed to be osseous, prevented all efforts at reduction. A general treatment was adopted for four days, when the operation for bubonocoele was proposed. The patient at first refused. When there became indications of suppuration, the tumour was opened, which allowed fetid pus to escape; a loop of intestine was found gangrenous, and there were extracted, in two or three endeavours, sixteen small bones of sheep's feet, which had been swallowed the evening previous to the accident. A fistulous opening followed, which became closed in thirty-four days.

CASE 49.—M. Hevin relates that Petit saw a man who was inconvenienced with an easily reducible hernia; it was the seat of very severe pains. The patient made useless efforts to reduce it, as usual, and would not consent to an operation. He died, and, on examination, the intestine was found pierced by the claw of a field-lark, swallowed some time previously.

### III.—FOREIGN BODIES IN THE APPENDIX VERMIFORMIS.

Foreign bodies in the appendix vermiformis are by no means rare, and must not be mistaken for concretions of internal origin; we shall only quote a few cases, as the subject is generally fully entered upon in medical works. They are very often fatal.

CASES 50, 51, 52.—Some few years ago we were called upon to make the post-mortem examination of a delicate girl, about twelve years old. She had been in pretty good health, attending to school, and playing about up to within a few days before death. She then complained of loss of appetite and general weakness, and was found dead in her bed.

On opening the body there was extensive puriform peritonitis of the lowest possible type, also ulceration of the vermiform process, and a small, leaden, foreign body making its way out.

Some cases were mentioned at the London Medical Society some time back; one, a case that had been described by Dr. Peacock, of a clergyman who presented the signs of an incipient hernia, when an abscess formed, which was opened, and a cherry-stone came away. He died subsequently, of some other disease. Also another case of cherry-stone in the appendix, which ended fatally, from acute peritonitis.

CASE 53.—*Case of foreign body in the appendix vermiformis.*—R. J—, æt. 14, was admitted into Guy's Hospital; an active, intelligent lad, who had for the most part enjoyed good health, though his bowels were apt to be very costive, and he sometimes had no evacuation for two or three days toge-



ther. Two days before admission he was attacked with a severe pain in the right iliac fossa, in consequence of which he took some purgative, which produced a scanty watery evacuation. After admission he was found lying on his back, complaining of great pain just within the anterior superior spinous process of the ilium, where there was tenderness upon moderate pressure, but he bore the pressure well over the rest of the abdomen. There was much anxiety in his countenance, and the pain was frequently much aggravated in paroxysms, during which he appeared in extreme agony. His respiration was hurried, and carried on with very little motion of the abdominal muscles. The tongue brown in the centre, and furred towards the edges; pulse above 100, full and compressible; urine scanty. In the evening he passed one scanty defecation, apparently water tinged with fæcal matter, although he had taken several doses of castor oil. He was ordered half an ounce of tincture of rhubarb and castor oil with five drops of laudanum immediately, and to be repeated in four hours. On the following day he was in much the same state, and the inguinal canals were carefully examined, but no signs of hernia could be detected. The tenderness was rather increased, and had extended across the pubes; pulse not so compressible, and the tongue more furred. In the evening he passed one very scanty fæcal evacuation, but no traces of the oil could be observed in it. On the third day he had passed a restless night, with frequent severe paroxysms of pain; the tenderness of the abdomen had extended, and the pulse sharper, and the tongue covered with a white fur, and he had all the signs of insidious peritonitis. Twelve leeches were applied to the abdomen; calomel, opium, and antimony, given every six hours.

On the fourth day he experienced some relief, but the pain soon returned again, and he had some tendency to vomit, but no evacuation had been passed. He was bled to six ounces, when signs of syncope supervened. He presented much the appearance of a person suffering from strangulated hernia. In the afternoon the pain and tenderness of the abdomen extended and increased; pulse 122, sharp and small. He had, however, a slight remission of suffering, but it came on very severe in the evening, when he had several fits of retching. He died at 5 o'clock the following morning.

On examination there was some disease of the lining membrane of the bowels, and general puriform peritonitis. A solid body was found in the appendix, which had ulcerated and perforated the peritoneum.

CASE 54.—In Guy's Museum is a preparation, No. 1894<sup>18</sup>, showing a pin found in the appendix cæci, of ordinary size, covered with a white deposit, invested by condensed tissue. The patient died with hepatic abscess, but the pin does not seem to have set up ulceration. The following entry is recorded :

Case of George A—, æt. 37 (10 Misc. Insp. Book, p. 89.)—The cæcum was pretty healthy, and the appendix ; yet a pin was found near its extremity, having entered head foremost, and the point having escaped through the coats, which at this spot only were thickened. The pin was black, coated with rust, and one half of its length enveloped in cellular membrane.

#### IV.—FOREIGN BODIES IN THE LARGE INTESTINES.

We shall now conclude by offering for perusal a few cases of foreign bodies in the large intestines, omitting purposely those in the rectum, as the latter are for the most part introduced from without through the anal aperture.

##### A. *Those in the cæcum.*

CASE 55.—Wingler (Vidal, op. cit., p. 388) opened the body of a person who died of hernia, and found the tumour was formed by small bones of a chicken, retained in the cæcum by its valve.

CASE 56.—A young man, æt. 25, was brought to the hospital at Poitiers ; he had in his right iliac region a hernia of the size of a pint bottle. This patient died two months after, and it was found that the hernia was formed by a large portion of the cæcum, and contained small bones of a pig and cherry-stones.

CASE 57.—Langstaff gives an account of a madman who swallowed a silver table-spoon in October, 1827. Soon after, his health gradually declined. Although he lived abstemiously, his digestive organs were disordered; he suffered from dyspepsia, and frequently complained of an acute pain in the region of the cæcum, and he persisted in declaring that all these symptoms were occasioned by the spoon he had swallowed. His account was disbelieved, especially as cautious examination of the belly was made without detection of any foreign body. He continued to suffer from the effects of pain in the situation of the cæcum and colon, and frequently said he felt the motion of the spoon. He was teased with diarrhœa, and the evacuations were often mixed with blood and pus. Symptoms of diseased liver came on, and were followed by ascites and œdema of the lower limbs. Under these circumstances Langstaff tapped him, drew off a bucketful of water, and, as he was "greatly emaciated, I was induced," says Langstaff, "to carefully examine with my hand if I could feel the spoon, when, to my astonishment, I detected a solid substance in the situation of the cæcum, which induced me to believe that it was the spoon he had swallowed." He died about twenty months after, and, on examination, it was found that "the mucous coat of the stomach, as well as the duodenum, jejunum, ileum, and cæcum, were more vascular than natural, and there were evident signs of their having been ulcerated on different portions, and that nature had put a perfect stop to the ulcerative process, by uniting the boundaries to the submucous tissue. The greatest degree of mischief had been effected by the passage of the spoon through the ilio-cæcal valve, which was greatly dilated, and the circumference thickened. The mucous coat of the cæcum was nearly destroyed by ulceration. The spoon was found in this intestine, with the bowl downwards, where it had formed a large sac, which prevented its passage into the colon. The preparation is now in the museum of the College of Surgeons.

•                      B. *Those in the colon.*

These cases are exceedingly rare, on account of the large diameter of the tube, for if the foreign body could have passed

through the whole alimentary canal beyond the cæcum, it must almost of necessity escape through the colon. Two conditions only can render their lodgment possible—1. Where the foreign body has collected around it hardened fæcal matter, accumulating upon it like the rolling of a snowball, meeting with scybalæ and hardened fæces, forming a large compact mass. 2. Where there is constriction of the tube from stricture, adhesions, adventitious membranes, and chronic disease of the bowels. These may interrupt the foreign body and produce obstruction.

CASE 58.—The following is an interesting case published in the ‘*Medico-Chirurgical Transactions*,’ by Mr. Clement, of Shrewsbury :—“Mrs. G—, æt. 47, was visited on October 8th, 1841, and found labouring under many of the symptoms usually attendant on strangulated hernia. The abdomen was greatly distended, but not very tender; there were distressing hiccough and almost incessant vomiting, which for two preceding days had been of a feculent nature. The pulse was small, rapid, and fluttering, and the countenance expressive of great anxiety. No evacuation had taken place from the bowels for fourteen days, and the usual purgative medicines had been prescribed, and enemata freely administered, without any beneficial result. Croton oil was administered, O’Beirne’s tube passed to the extent of fourteen inches, and warm water injected; she, however, became worse, and the operation of opening the colon was determined on. The seat of obstruction was on the right side; the right inguinal and iliac regions were dull, fuller, and more distended than the left, which was much more apparent in the right lumbar region. The ascending colon was opened on the right side by Amussat’s method.

The relief experienced by the patient was most decided and immediate. In the course of a quarter of an hour the tension of the abdomen had much diminished, the hiccough ceased, and after several pints of feculent matter had been evacuated, the discharge gradually abated; she recovered with scarcely a bad symptom, passing her evacuations through the artificial anus. The patient was provided with a short tube of elastic gum, which she was directed to wear in the artificial anus, and to remove it whenever she felt an inclination to evacuate the

bowels. In six weeks from the day of the operation the patient walked the distance of a mile, and declared herself better in health than for many years past.

The discharge of *fæces* now began gradually to decrease; she was troubled greatly with flatulence, and occasionally with sharp lancinating pains in the abdomen. At the end of seven weeks the vomiting returned, accompanied with severe colicky pains, and after some time a hard substance shot out from the artificial anus, which, on examination, was found to consist of five plum-stones, firmly agglutinated to each other. These were followed by sixteen plum-stones, and afterwards by a very copious feculent evacuation. On the following day three more stones were found to exist, accompanied with two small bones, belonging, probably, to the pinion of a duck.

Nine months after the operation the patient enjoyed perfect health; every week she took castor oil, which expelled one or two plum-stones. The progress of the case, until six weeks of the patient's death, presented no features of particular interest or importance. At irregular intervals other plum-stones were discharged, and the total number collected was 116. She became much thinner, took but little sustenance, had no evacuation for many days, and obstinately refused any medicine. She died three years after the operation.

On examination there was an absence of all traces of inflammatory action in the peritoneum; there was no thickening, no adhesion, or deposition of lymph. At the junction of the ascending colon with the transverse arch there was a more rigid stricture, as if a piece of whipcord had been firmly tied round this part of the intestines. The stricture itself was of cartilaginous hardness, and the closing of the canal so complete that it would not admit the passage of even a bristle. The extent of the stricture was not quite a quarter of an inch, of a white pearly appearance, perfectly smooth, and having no more vascularity than a tendon.

CASE 59.—*Binigerus* (Cent. ii, Obs. 20). A person had a hard swelling in his hypogastrium; he complained continually of acute pains over the whole abdomen, with frequent borborygmi. He died, not having been able to take anything but liquid food for three years. On the post-mortem, the

colon was found sphacelated and open; it was distended by a mass of prune and cherry stones, which weighed more than three pounds; there was also found in this impaction forty leaden balls, which had been swallowed at different times to relieve him.

We have thus collected a few cases of foreign bodies lodged in the small and large intestines, but hardly sufficient to draw any warrantable conclusions.

The symptoms induced are very vague and uncertain, and give no evidence of either the presence or situation of the foreign body; they may consist of those of acute and chronic enteritis, cæcitis and colitis, and even peritonitis.

The foreign body may cause ulceration of the gut, and induce its symptoms; but it more often would penetrate through, causing the symptoms of perforation, collapse, and fatal peritonitis.

It may, again, make its way to the surface of the body by progressive inflammation, adhesion, ulceration, and suppuration, ending in an external abscess, which, when opened, gives exit to the foreign substance.

By far the most fatal and complicated condition is the impaction of the foreign body in some part of the gut, such as the lower part of the ileum, the cæcum, &c., causing at first partial, then total, obstruction of the gut, forming what is termed an internal strangulation or hernia.

We shall not enter into detail concerning the above conditions, as the symptoms, prognosis, and treatment, are detailed in all the standard works on medicine, in the articles on diseases of the intestinal canal.

With respect to internal strangulation, we must likewise refer the reader to the excellent memoir on the subject in the 'Medico-Chirurgical Transactions,' written by Mr. B. Phillips. He will here find described the symptoms, the difficulty of diagnosis, and the modes proposed for treatment.

As before stated, we have not alluded to concretions in the stomach and intestines, as acting as foreign bodies, inasmuch as these are also fully discussed in Mr. Phillips's paper. However, we have made the following extract from Cooper's Surgical Dictionary, in reference to these concretions:

*“Concretions in the bowels, S. Cooper.*—The symptoms induced by the lodgment of large concretions in the bowels are of a formidable description—severe pains in the stomach and bowels, diarrhœa, violent vomiting of blood and mucus, a discharge of thin fetid matter from the rectum, a difficulty of voiding the excrement, an afflicting tenesmus, extreme emaciations, and debility. In cases like that reported by Mr. Hey (*‘Pract. Obs.,’* 509, ed. 2), where the colon was entirely obstructed, surgeons have been advised to cut into that bowel and extract the foreign body. Let the inexperienced admirer of curious feats with the scalpel, however, pause a little before he ventures to make up his mind upon this matter; and at all events let him know that some serious mistakes have nearly been made. ‘Upon the very bold operation of cutting out these concretions, when lodged in the colon, proposed by Dr. Monro, Sen. (See Monro’s *‘Morbidity Anatomy of the Human Gullet, &c.,’* p. 63), we think it our duty to state that the diagnosis is so difficult that in one case, where the operation was strongly advised, it turned out, upon dissection, that the disease was a scirrhus pylorus.’” (See *‘Edinb. Med. and Surg. Journal,’* No. 33, p. 112.)

As regards the diagnosis of foreign bodies in the intestines, almost the same remarks apply here as made in reference to those in the stomach, viz.—Is the foreign body in the intestine? If so, is it in the small or large intestine? If in the small intestine, at what part is it lodged?

These are questions extremely difficult to determine.

Supposing, after all, the presence and exact site of the foreign body has been accurately ascertained, what is to be done? Are we to perform enterotomy?

Respecting the propriety and mode of performing enterotomy, as well as gastrotomy, we cannot here enter into that question; but we shall in some future number take up this important subject, when introducing a paper on penetrating wounds of the abdomen. By so doing we shall learn from nature her successful modes of performing the repair of accidental gastrotomy and enterotomy, and thus enable us to follow out her suggestions and wise provisions in gaining a successful issue.

SOME OBSERVATIONS  
ON THE  
IODIC ACID TEST FOR MORPHIA.

---

BY A. DUPRÉ, Ph.D., F.C.S.

---

HAVING frequently observed that students failed to obtain the blue iodide of starch by the action of iodic acid on morphia, even when using quantities of the alkaloid much more considerable than are generally alleged to yield the result, I have been induced to examine into the circumstances most favorable for the successful application of this test.

The iodic acid used in the following experiments was prepared by dissolving one part of the crystallized acid in fifteen parts of water. When less strong, the solution does not react readily with dilute solutions of morphia; while, if much more concentrated, it interferes with the delicacy of the reaction, iodic acid having to a certain extent the property of decolorising the blue iodide of starch. The starch solution was made by boiling five grains of starch in 2000 grains of water. It should always be freshly prepared. As starch does not show the blue colour in presence of an excess of iodine, but then only assumes a dirty green, care should be taken to add a sufficient quantity of it when working with strong solutions of morphia; on the other hand, a great excess of starch destroys the colour, which should be remembered when working with very dilute solutions or very small quantities of morphia.

*Morphia or its salts in the solid state.*—Morphia, or any of its salts, when moistened with iodic acid, instantly assumes



a brown colour, and the smell of iodine is developed; the addition of starch produces the blue iodide of starch. Quantities as low as  $\frac{1}{300}$ th of a grain give this reaction readily; smaller quantities do not give the reaction satisfactorily in this manner; and if less than  $\frac{1}{300}$ th grain be taken, the reaction becomes altogether uncertain; it is somewhat more delicate if the starch be added before the iodic acid. The test may, however, be made much more delicate in the following manner. A drop of starch should be added to the morphia, and the whole carefully evaporated to dryness. The dry residue left, after cooling, should be moistened with iodic acid, when it will assume a dark-blue colour, which is still well marked, even though not more than  $\frac{1}{10,000}$ th grain of morphia be present.

*Solutions of morphia.*—The more concentrated solutions were, of course, made with salts of morphia; they should be neutral, and any excess of hydrochloric acid should be especially avoided, since this is decomposed by the iodic acid with liberation of chlorine, which entirely prevents the formation of the blue iodide of starch. A solution of morphia, or of any of its salts, has also the property of decolorising the blue starch compound, or of preventing its formation. In strong solutions of the alkaloid care must be taken on this account to add a sufficient amount of iodic acid, avoiding at the same time any very great excess.

Solutions of morphia, when mixed with iodic acid, acquire a yellow tint, the depth of which and the time in which it appears depend on the strength of the two solutions. When they are concentrated, the colour appears immediately, and is of a deep reddish-yellow; when diluted, some time elapses before its production, and it is then a yellow tint. This yellow coloration is still perceptible if the solution contains no more than 1 part of morphia to 20,000 parts of water. The point at which the colour of a liquid ceases to be visible of course depends on the quantity of fluid used, as also somewhat on the shape of the vessel in which it is contained; the above statement refers to quantities of twenty or thirty grains of liquid put into ordinary narrow test-tubes. Starch added to this yellow mixture produces the well-known blue colour, if the morphia be not dissolved in more than from

400 to 600 parts of water ; in more dilute solutions the test becomes uncertain, though it often succeeds if only  $\frac{1}{800}$ th or  $\frac{1}{1000}$ th part of morphia be present. Below this proportion the liquid, although still strongly yellow, fails entirely to answer to the test ; thus showing either that the coloration is not due to liberated iodine, or that the morphia and iodic acid possess a considerable preventive power as regards the action of iodine on starch, although they may not enter into any definite combination with it. Ordinary reducing agents, even when so diluted that the yellow colour due to the liberated iodine is no longer perceptible, still give a strong blue on addition of starch, provided no great excess of iodic acid has been used.

In 1861 Lefort<sup>1</sup> recommended the addition of ammonia, instead of starch, to the mixture of morphia and iodic acid. The colour is thereby considerably deepened, and rendered a dark brown in strong, a light brown changing to pink in dilute, solutions. The yellow colour produced by most other agents reducing the iodic acid is entirely discharged by ammonia, and thus are removed many of the objections that may be urged against the iodic acid test, as hitherto employed. This test is also far more delicate when applied to solutions than the starch test above described, as it will render the coloration visible in solutions containing no more than  $\frac{1}{30,000}$ th part of morphia. A process will, however, presently be given by which the starch test is rendered almost equally delicate. In applying this test, the iodic acid must be added first, and in dilute solutions the mixture should be allowed to stand for about ten minutes before the ammonia is put in, as otherwise the coloration may be entirely prevented. Lefort recommends to moisten strips of unsized paper repeatedly with the morphia solution, carefully drying them each time, and then to apply the test to the paper thus prepared.

It has been stated above that starch fails to give the blue reaction with solutions of morphia containing less than  $\frac{1}{800}$ th part. It may, however, be readily made to do so in even much more diluted solutions, by the careful addition of ammonia, taking care to avoid the slightest excess. In very dilute solutions it is not easy to add the proper amount of ammonia, and it is therefore better to proceed in the fol-

<sup>1</sup> Lefort, 'Journ. Pharm.,' (3), xl, 97.

lowing manner. After the mixture of morphia, iodic acid, and starch, has been allowed to stand for ten minutes, a very dilute solution of ammonia is carefully poured upon the top of it, which may be easily done by means of a small pipette. After a longer or shorter time, according to the strength of the morphia solution, two coloured rings make their appearance at the place where the two layers are in contact. The lower one, in the acid layer, is blue; the upper one, in the ammonia, is brown. The rings are usually in contact, and may be clearly perceived in solutions containing not more than the  $\frac{1}{20,000}$ th part of morphia. The brown ring alone may be seen in still more dilute solutions. If the two layers are finally mixed, the whole assumes the brown or pink colour of Lefort's test. If the morphia solution is very diluted, not more than one drop each of solutions of starch and of iodic acid should be added to about twenty drops of the suspected liquid.

*Delicacy of the reaction.*—When the test is applied to the dry morphia,  $\frac{1}{10,000}$ th of a grain will give the reaction. When applied to solutions, the test is not nearly so delicate, and  $\frac{1}{1000}$ th of a grain may be put down as the smallest quantity that will give the reaction satisfactorily.

*Objections.*—As the objections to the iodic acid and starch test, as usually employed, are given in all books on poisons, it is unnecessary here to allude to them. As regards the ammonia test, morphia seems to be the only substance that gives rise to this reaction. Several precautions are, nevertheless, necessary, either when using ammonia alone, like Lefort, or when using the starch and ammonia in the manner described in this paper. Extremely dilute solutions of a sulphite, sulphocyanide, or other substance reducing the iodic acid, will also give rise to the blue ring; but neither is the brown ring present nor will the whole assume a brown colour on mixing the two layers. Solutions of aniline, when mixed with iodic acid, assume a violet colour, which, on addition of ammonia, is changed to brown. In very dilute solutions this might be mistaken for the reaction of morphia. No iodine is, however, liberated, and starch consequently fails to give any reaction. In moderately strong solutions the deep-violet colour produced is in itself sufficient to guard against any

mistake. If dilute solutions of aniline are mixed with iodic acid and starch, and then covered with a layer of ammonia, as above described in testing for morphia, a brown ring is produced in the ammonia. The absence, however, of the blue ring, and the slight pink colour of the lower layer, render the reaction sufficiently distinct from that of morphia. It will be seen, from the above, that a mixture of aniline with some other reducing agent would give very similar reactions with iodic acid as does morphia; although the aniline, to a considerable extent, neutralises the effect of the reducing agent, by reabsorbing the liberated iodine. The test should therefore be employed only after means have been used to obtain the morphia in a tolerable state of purity.

The iodic acid cannot be replaced in these reactions by a mixture of an iodate with sulphuric acid, since this gives rise to colour reactions with a number of other alkaloids.



**LIST**  
**OF**  
**GENTLEMEN EDUCATED AT GUY'S HOSPITAL,**  
**WHO HAVE PASSED THE**  
**EXAMINATIONS OF THE SEVERAL UNIVERSITIES, COLLEGES,**  
**&c. &c.**

---

**University of London.**

**EXAMINATION FOR DOCTOR OF MEDICINE.**

Charles Hilton Fagge.		John Henry Galton.
-----------------------	--	--------------------

**EXAMINATION IN PHYSIOLOGY PREPARATORY TO SECOND BACHELOR  
OF MEDICINE EXAMINATION.**

John Jones Phillips.		James Beddard.
----------------------	--	----------------

**FIRST EXAMINATION FOR BACHELOR OF MEDICINE.**

**First Division.**

*Oliver Thomas Duke. Charles Smith.		† George Henry Savage. Francis T. Tayler, B.A.
--	--	---

**EXCLUDING PHYSIOLOGY.**

**First Division.**

Henry Charles Hilliard.		Ebenezer F. Turner.
-------------------------	--	---------------------

\* Obtained Honours in Anatomy.

† Obtained Gold Medal for Materia Medica and Chemistry.

330 *Gentlemen admitted to Practice since September, 1862.*

PRELIMINARY SCIENTIFIC EXAMINATION.

ENTIRE.

First Division.

John Augustus Ball.  
Benjamin Chester Gowing.

\* Stephen Wootton Bushell.

Second Division.

Reginald Eager.

CHEMISTRY AND BOTANY ONLY.

Augustus Barber Fry

| † Henry Greenway Howse.

\* Obtained Honours in Chemistry and Natural Philosophy.

† Obtained the Exhibition and Gold Medal in Biology.

---

University of Cambridge.

SECOND EXAMINATION FOR BACHELOR OF MEDICINE.

Alfred G. P. Wilks, M.A.

| Thomas D. Welch, M.A.

---

Royal College of Physicians.

EXAMINATION FOR LICENTIATESHIP.

OCTOBER, 1862.

Frederick Woodman.

FEBRUARY, 1863.

Washington Lovegrove.

APRIL.

Thomas Carter.

| John Ellerton.

JULY.

Elijah Baxter Forman.

| Frederick Long.

Aaron George Medwin.

Edward Whitfeld Thurston.

FIRST EXAMINATION FOR LICENTIATESHIP.

OCTOBER, 1862.

E. Baxter Forman.

| Harry Gage Moore.

DECEMBER.

Henry Brietzcke.

FEBRUARY, 1863.

Edwin Barrell.

| Washington Lovegrove.

*Gentlemen admitted to Practice since September, 1862.* 331

APRIL.

Chauncy Puzey.

JULY.

Henry Todd Broughton.  
George Eastes.  
Marmaduke J. Mayou.  
George H. Savage.  
Francis T. Tayler, B.A.  
Ebenezer F. Turner.

Oliver Thomas Duke.  
George Elkington.  
George Paddon.  
Charles Smith.  
Arthur Taylor.  
Charles J. Wright.

---

University of St. Andrew's.

OCTOBER, 1862.

Thomas Dry.  
Morgan J. Edwards.

Walter Mackern.  
John Tanner.

NOVEMBER.

Samuel Cookson.  
Astley A. C. Cooper.

Stephen Duke.  
R. G. Freeman.

DECEMBER.

George M. Ashforth.  
Lionel Booth.  
Charles F. Harding.  
Henry M. Hawkins.  
Thomas W. King.  
Robert T. Nichols.  
John L. Pritchard.  
David M. Sarjeant.  
Isaac Watchorn.  
William W. Ballard.  
Walter T. Beeby.  
John Ellerton.  
William Murdoch.

William A. Elliston.  
William R. Grove.  
Edward Hibberd.  
Edward A. Howsin.  
Aaron G. Medwin.  
Henry Owens.  
Edward Ray.  
George P. Sargent.  
Thomas H. Barnes.  
John M. Bright.  
Henry R. Fawcus.  
Frederick Woodman.

EXAMINATION FOR HONOURS.

First Class.

Edward Ray.

Second Class.

John M. Bright.

John L. Pritchard.

---

Apothecaries' Hall.

GOLD MEDAL FOR BOTANY.

Henry G. Howse.



**332 Gentlemen admitted to Practice since September, 1862.**

**Royal College of Surgeons.**

**FELLOW BY EXAMINATION.**

**MAY, 1863.**

**Edward Lund.**

**MEMBERS BY EXAMINATION.**

**NOVEMBER, 1862.**

Charles F. Harding.  
Allen Græme C. Mann.  
John B. M. Evans.

Robert L. Jordison.  
William A. Ellistson.

**JANUARY, 1863.**

William A. Bracey.  
William Row.  
George P. Sargent.  
William Frank Smith.

Joseph Willes.  
Arthur N. Turner.  
William C. Daniel.  
Philip H. Pye Smith.

**APRIL.**

Arthur Evershed.  
Arthur B. J. Eddowes.  
John D. Frankish.  
Thomas E. Mason.  
E. Whitfeld Thurston.  
Joseph Jeffery.  
John A. Nunneley.

Harry Gage Moore.  
Frederick T. Fagge.  
John W. Martindale.  
Aaron G. Medwin.  
Thomas Carter.  
Thomas King.

**MAY.**

Ebenezer Atherton.  
E. Baxter Forman.  
Frederic T. Hindle.  
John S. Harvey.  
George F. W. Meadows.  
Thomas Holyoake.  
Francis H. Wood.  
Roderick W. Henderson.  
Robert T. Nichols.  
Charles White.

Walter T. Beeby.  
Thomas Jackson.  
Frederick Long.  
William M. Seabrook.  
John Brockwell.  
Thomas Miles.  
John Chaundy Clarke.  
William Jones.  
Alfred Sheen.  
Frederick Lawton.

**JULY.**

Wm. Parsons Knott.  
Henry Brietzcke.  
Arthur G. Mickley.  
George Starling.  
Frederick S. Taylor.  
Chauncy Puzey.

Henry O. F. Butcher.  
Edward C. Haden.  
Henry McK. Parkes.  
John C. Robinson.  
Isaac T. Bridgman.

**Licentiates in Midwifery.**

Edward Hibberd.  
John Cook.  
Robert Lloyd Jordison.

Henry Ellery Trehella.  
John Ellerton.

**FIRST, OR ANATOMICAL AND PHYSIOLOGICAL EXAMINATION.**

**NOVEMBER, 1862.**

William C. Daniel.

W. M. Seabrook.

**JANUARY, 1863.**

H. J. Dwelly.  
H. O. F. Butcher.  
G. R. T. Phillips.  
Frederick Sutton.  
Frederick S. Taylor.

Thos. F. Lloyd.  
Roderick W. Henderson.  
J. Craven Robinson.  
Henry McK. Parkes.

**APRIL.**

R. R. Daglish.  
W. P. Knott.  
R. W. Barraclough.  
E. C. Roberts.  
R. C. Earle.  
T. H. Knott.  
M. J. Mayou.  
Arthur Taylor.  
Henry Viant.  
Chas. G. Bott.  
Henry G. Howse.  
George H. Savage.  
Edward P. Shorland.  
J. Augustus Ball.  
Thomas Collier.  
Joseph Johnson.  
Thomas P. Warren.

Ebenezer F. Turner.  
J. W. Hayward.  
Nyman H. Lower.  
Reginald Eager.  
E. Septimus Green.  
Frederick Manser.  
H. Octavius Steele.  
J. G. F. Wilford.  
A. E. Wilmot.  
G. F. Hankins.  
George Paddon.  
Charles Smith.  
Francis T. Tayler.  
J. Arthur Ensor.  
F. W. Humphreys.  
James Milward.

**MAY.**

Henry Couling.  
J. C. Dwyer.  
E. L. Fyson.  
A. C. Jackson.  
Samuel F. Leach.  
Charles J. Trenerry.  
A. H. Wheldon.  
H. C. Hilliard.

H. B. Spurgin.  
Henry Dawson.  
T. R. Nason.  
George Rendle.  
H. R. Smith.  
J. W. Barrett.  
George Eastes.  
W. T. H. Wood.

334 *Gentlemen admitted to Practice since September, 1862.*

JUNE.

F. W. Armitage.  
Alfred Charlton.  
J. W. Smith.

J. R. Leake.  
Chas. F. Long.  
G. F. E. Wilkinson.

---

**Licentiates of the Apothecaries' Society.**

OCTOBER, 1862.

Cleveland Smith.

Robert Thomas Nichols.

NOVEMBER.

Aaron G. Medwin.

Arthur Roper.

DECEMBER.

Henry R. Fawcus.  
William L. Cass.

Henry Lyell.  
Adam Rae Martin.

JANUARY, 1863.

George P. Sargent.  
Edward Leeds.

Allan G. C. Mann.  
John Lyman.

FEBRUARY.

George J. Blasson.

Robert Slade.

MARCH.

William A. Bracey.

APRIL.

Thomas Carter.

William Row.

MAY.

John D. Frankish.  
Thomas E. Mason.

Frederick Sutton.  
Robert L. Jordison.

JUNE.

Thomas H. Barnes.

Joseph Willes.

JULY.

Thomas Jackson.  
Ebenezer Atherton.

Arthur N. Turner.  
J. W. Martindale.

**FIRST EXAMINATION.**

**OCTOBER, 1862.**

William A. Bracey.

George Elkington.

**NOVEMBER.**

Thomas Miles.

**DECEMBER.**

John Sidney Turner.

Edwin Burrell.

Frederick McNair.

Frederick Sutton.

**FEBRUARY, 1863.**

Edward A. Burnham.

Chauncy Puzey.

**JUNE.**

George F. Hawkins.

**JULY.**

Edward P. Shorland.

Thomas H. Knott.

Henry Viant.

Henry Broughton.

Henry Dawson.

John A. Ensor.

Chas. F. Long.

Frederick Manser.

Henry O. Steele.

**AUGUST.**

Arthur Taylor.

William H. Vipan.

**GUY'S HOSPITAL MEDALLISTS AND PRIZEMEN, 1862-3.**

**EXAMINATION OF STUDENTS IN MEDICINE AND ITS**

**ALLIED SCIENCES, AUGUST 3RD, 1863.**

**THIRD YEAR'S STUDENTS.**

Edward Whitfeld Thurston, Ashford, Kent, the Treasurer's Gold Medal for Clinical Medicine.

Edward Whitfeld Thurston, the Treasurer's Gold Medal for Clinical Surgery.

Edward Whitfeld Thurston, first Prize, £40.

E. Baxter Forman, Derby, second Prize, £35.

**SECOND YEAR'S STUDENTS.**

Henry G. Howse, Reading, first Prize, £35.

Second Prize, of £30, not Awarded.

**336    *Gentlemen appointed Dressers since October, 1862.***

**FIRST YEAR'S STUDENTS.**

Henry Denne, Sandwich, first Prize, £30.  
James Rawlings, St. Pinnock's Rectory, Liskeard, second Prize, £25.  
William Arthur Brailey, Rochester, third Prize, £10 10s. (presented by one of the Governors.)  
John Gill, Weston, Hawkstone, Shrewsbury, Honorary Certificate.  
Henry S. Taylor, Alton, Hants, Honorary Certificate.  
Frederick Edward Manby, East Rudham, Norfolk, Honorary Certificate.

---

**ENTRANCE EXAMINATION IN CLASSICS, MATHEMATICS, &c.,  
OCTOBER, 1862.**

William Arthur Brailey, Rochester, first Prize, £25.  
Second Prize of £20, not Awarded.  
George Rolph Raine, Billericay, Essex, third Prize, £15.  
Henry Morris, Petworth, Sussex, Honorary Certificate, £10.

---

**GENTLEMEN WHO HAVE HELD THE APPOINTMENT OF  
HOUSE-SURGEON.**

Thomas Stevenson.  
Arthur Evershed.

Richard Davy.

---

**GENTLEMEN APPOINTED DRESSERS SINCE OCTOBER, 1862.**

Arthur N. Turner.  
Montague F. Evershed.  
William A. Elliston.  
Thomas F. Hindle.  
John W. Martindale.  
E. Whitfeld Thurston.  
Edward R. Ray.  
Aaron G. Medwin.  
Robt. L. Jordison.  
A. G. P. Wilks.  
Thomas D. Welch.  
William C. Lucey.  
Frederick McNair.

Harry Gage Moore.  
Robt. T. Nichols.  
John C. Clarke.  
Philip H. Pye Smith.  
Arthur Evershed.  
Thomas Jackson.  
Charles White.  
Frederick Long.  
Ebenezer Atherton.  
Isaac T. Bridgman.  
E. Baxter Forman.  
Frederick Lawton.  
Walter T. Beeby.

**DRESSERS IN THE OPHTHALMIC WARD.**

Frederick Long.  
E. Baxter Forman.  
John J. Phillips.  
Arthur G. Mickley.  
E. Whitfeld Thurston.  
Harry Gage Moore.

Frederick T. Hindle.  
William Jones.  
William C. Lucey.  
George H. Hills.  
Henry Brietzcke.  
Frederick Sutton.

**DRESSERS TO THE ASSISTANT-SURGEONS.**

Edward R. Ray.  
Arthur G. Mickley.  
Thomas Jackson.  
George Eastes.  
John J. Phillips.  
A. G. Medwin.  
Thomas Carter.  
G. F. W. Meadows.  
Alfred Sheen.  
Charles Franklin.  
George Wall.  
Robert Orme.  
Francis H. Wood.  
H. O. F. Butcher.  
J. Arthur Ensor.  
Henry J. Dwelly.  
Herbert B. Spurgin.  
William H. Vipan.  
Henry T. Broughton.

Thomas King.  
Henry Brietzcke.  
Charles White.  
John W. Martindale.  
John Brockwell.  
Isaac T. Bridgman.  
Frederick Lawton.  
H. Skey Muir.  
J. Sidney Turner.  
Thomas D. Welch.  
Edwin Burrell.  
R. W. Henderson.  
H. Mc K. Parkes.  
Henry Couling.  
J. G. F. Wilford.  
Frederick Manser.  
George Starling.  
R. C. Earle.  
E. C. Roberts.

**GENTLEMEN APPOINTED CLINICAL CLERKS.****WINTER SESSION, 1862-63.**

Phillip H. Pye Smith.  
Lionel Booth.  
Arthur Evershed.  
Henry Lyell.  
Aaron G. Medwin.  
John T. Dickson.  
Arthur G. Mickley.

Thomas Stevenson.  
A. G. P. Wilks.  
E. Whitfeld Thurston.  
Thomas D. Welch.  
Frederick Long.  
Ebenezer Atherton.

**SUMMER SESSION, 1863.**

Harry Gage Moore.  
G. F. W. Meadows.  
Frederick McNair.

John J. Phillips.  
John C. Clarke.  
Charles Trenerry.

**GENTLEMEN APPOINTED TO CONDUCT THE POST-MORTEM EXAMINATIONS.**

William C. Lucey.  
 Ebenezer Atherton.  
 Edwin Burrell.  
 Henry Broughton.  
 Herbert B. Spurgin.  
 Henry Brietzcke.

Chauncy Puzey.  
 Frederick Sutton.  
 Frederick McNair.  
 John W. Hayward.  
 George Starling.  
 George H. Hills.

**GENTLEMEN APPOINTED DENTAL SURGEONS' DRESSERS.**

Walter T. Beeby.  
 G. H. Hills.  
 Oliver T. Duke.  
 Isaac T. Bridgman.  
 G. H. Savage.  
 John J. Phillips.

Thomas Carter.  
 Chas. Trenerry.  
 Chauncy Puzey.  
 J. Sidney Turner.  
 H. J. Dwelly.  
 George Eastes.

**SENIORS IN THE CHARITY.**

1862.	September	.	.	.	.	Thomas Stevenson.
	October	.	.	.	.	Cleveland Smith.
	November	.	.	.	.	J. Alonzo Taylor.
	December	.	.	.	.	H. E. Trewhella.
1863.	January	.	.	.	.	Julius St. T. Clarke.
	February	.	.	.	.	Lionel Booth.
	March	.	.	.	.	A. G. P. Wilks.
	April	.	.	.	.	W. Leonard Cass.
	May	.	.	.	.	Robert T. Nichols.
	June	.	.	.	.	W. Frank Smith.
	July	.	.	.	.	William Row.
	August.	.	.	.	.	Philip H. Pye Smith.

**HONORARY CERTIFICATES AWARDED FOR 100 CASES OF MIDWIFERY.**

John Gittens.  
 W. T. G. Hicks.

Thos. H. Barnes.  
 A. C. Jackson.

**PUPILS' PHYSICAL SOCIETY.**

**PRIZE FOR BEST REPORTED CASES WITH REMARKS.**

**J. J. Phillips.**

**PRIZE FOR BEST ESSAY READ BEFORE THE SOCIETY.**

**E. B. Forman.**

---

**NUMBER OF CASES OF LABOUR ATTENDED DURING ONE YEAR.**

1862.	September	.	.	.	.	.	145
	October	.	.	.	.	.	119
	November	.	.	.	.	.	181
	December	.	.	.	.	.	142
1863.	January	.	.	.	.	.	135
	February	.	.	.	.	.	123
	March	.	.	.	.	.	147
	April	.	.	.	.	.	129
	May	.	.	.	.	.	139
	June	.	.	.	.	.	110
	July	.	.	.	.	.	99
	August	.	.	.	.	.	142
							<hr/>
							1611
							<hr/>



# GUY'S HOSPITAL.

1863-64.

---

## THE MEDICAL SESSION

COMMENCES ON THE FIRST OF OCTOBER.

The Introductory Address will be given by **FREDERICK WILLIAM PAVY, M.D., F.R.S.**, on Thursday, the First of October, at Two o'clock.

Gentlemen desirous of becoming Students must produce satisfactory testimony as to their Education and Conduct.

Fee for Hospital Practice and Lectures:—First year, £40; second year, £40; and £10 for every succeeding year of attendance. One payment of £100 entitles a Student to a perpetual Ticket. The expenses for material in practical courses are extra.

Clinical Clerks, Dressers, Ward Clerks, Dressers' Reporters, Obstetric Residents, and Dressers in the Eye-Wards, are selected according to merit from those Students who have attended a second year. Each Dresser (except those in the Eye-Wards) has the privilege of rooms and commons in the Hospital free of charge for one month of his course. The Obstetric Residents have the like privilege for two months each—one month as junior, another as senior. A Resident House-Surgeon is appointed every six months from those Students who have obtained the College Diploma.

The Students are required to conform to the Rules and Regulations for the internal management of the Hospital.

The privileges of a Student will be withdrawn in the event of neglect or misconduct.

Certificates will not be given for Lectures or Practice, unless duly attended.

The Winter Session terminates March 31st.

The Summer Session commences May 2nd, and concludes July 30th.

---

## VOLUNTARY EXAMINATIONS

WILL BE HELD AT FOUR PERIODS OF THE STUDENT'S COURSE,  
AS FOLLOWS:

**FIRST.**—At Entrance; and will take place this year on Monday, October 12th. It will comprise Elementary Classics, Ancient and Modern History, and Mathematics. The Candidate who shall distinguish himself the most, will receive £25; the second Candidate, £20; and the third, £15.

**SECOND.**—At the end of July in the first year, on all the Subjects of the first year's Course of Study, one sum of £30, another of £25,

and a third of £10 10s. (presented by one of the Governors), will be given according to proficiency.

**THIRD.**—At the end of July in the second year, on the Subjects which form the Course of Study up to that time, £35 and £30.

**FOURTH.**—At the end of July in the third year, on all the Subjects of the Curriculum, £40 and £35.

No Prize will be awarded unless the Candidates possess sufficient merit.

**HONORARY CERTIFICATES** will be given to those Candidates who pass a creditable Examination.

---

### SPECIAL EXAMINATION.

**TWO GOLD MEDALS** are given annually by the Treasurer to Students at the end of their third year: one for Clinical Medicine, and the other for Clinical Surgery.

---

### SINGLE COURSES OF LECTURES

**MAY BE ATTENDED ON THE FOLLOWING TERMS:**

Anatomy, Physiology, Demonstrations and Dissections, Medicine, Surgery, Chemistry, Midwifery, on the payment of Five Guineas for each Course of Lectures.

**Materia Medica, Medical Jurisprudence, Botany, Practical Chemistry, Comparative Anatomy,** on the payment of Four Guineas for each Course.

Fee for Attendance on either the Medical or Surgical Practice of the Hospital:—Three Months, Ten Guineas; Six Months, Fifteen Guineas; Twelve Months or Perpetual, Twenty-five Guineas.

Several of the Lecturers have vacancies for private pupils.

---

### MEDICAL OFFICERS.

*Physicians.*—G. H. BARLOW, M.D.; OWEN REES, M.D., F.R.S.; W. W. GULL, M.D.

*Assistant Physicians.*—S. O. HABERSHON, M.D.; S. WILKS, M.D.; F. W. PAVY, M.D., F.R.S.

*Surgeons.*—EDWARD COCK, Esq.; J. HILTON, Esq., F.R.S.; J. BIRKETT, Esq.; A. POLAND, Esq.

*Assistant Surgeons.*—J. COOPER FORSTER, Esq.; THOMAS BRYANT, Esq.; ARTHUR DURHAM, Esq.

*Obstetric Physician.*—HENRY OLDHAM, M.D.

*Assistant Obstetric Physician.*—J. BRAXTON HICKS, M.D., F.R.S.

*Surgeon-Dentist.*—J. SALTER, Esq., F.R.S.

*Surgeon-Aurist.*—JAMES HINTON, Esq.

*Eye Infirmary.*—*Consulting Surgeon*, JOHN F. FRANCE, Esq.

*Surgeon.*—A. POLAND, Esq.

*Assistant Surgeon.*—C. BADER, Esq.

*Apothecary.*—JAMES STOCKER, Esq.

## LECTURES, &c.

### WINTER COURSES.

*Medicine.*—DR. OWEN REES and DR. GULL, Mondays, Wednesdays, and Fridays, at half-past three.

*Clinical Medicine.*—DR. BARLOW, DR. OWEN REES, and DR. GULL.

*Surgery.*—MR. HILTON and MR. BIRKETT, Tuesdays, Thursdays, and Saturdays.

*Clinical Surgery.*—MR. COCK, MR. HILTON, MR. BIRKETT, and MR. POLAND.

*Anatomy, Descriptive and Surgical.*—MR. POLAND and MR. COOPER FORSTER, Mondays, Tuesdays, Thursdays, and Fridays, at nine.

*Physiology and Microscopic Anatomy.*—DR. PAVY, Tuesdays, Thursdays, and Saturdays, at half-past twelve.

*Demonstrations on Anatomy.*—Principal Demonstrator—WALTER MOXON, M.B. Demonstrators—MR. BANKART and DR. HILTON FAGGE, daily.

*Demonstrations on Morbid Anatomy.*—DR. WILKS, daily, at half-past two.

*Clinical Lectures on Midwifery and Diseases of Women.*—DR. OLDHAM and DR. HICKS.

*Chemistry.*—DR. ALFRED S. TAYLOR, Tuesdays, Thursdays, and Saturdays, at eleven.

*Experimental Philosophy.*—DR. HILTON FAGGE, Wednesdays, at twelve.

*Lying-in Charity.*—DR. OLDHAM and DR. J. BRAXTON HICKS.

*Curator of the Museum.*—DR. WILKS.

### SUMMER COURSES.

*Demonstrations on Cutaneous Diseases.*—DR. HABERSHON, Tuesdays, at one.

*Materia Medica.*—DR. HABERSHON, Tuesdays, Thursdays, and Saturdays, at three.

*Clinical Medicine.*—DR. HABERSHON, DR. WILKS, and DR. PAVY.

*Clinical Surgery.*—MR. COOPER FORSTER, MR. BRYANT, and MR. DURHAM.

*Midwifery.*—DR. OLDHAM and DR. BRAXTON HICKS, Tuesdays, Wednesdays, Thursdays, and Fridays, at a quarter to nine.

*Medical Jurisprudence.*—DR. ALFRED S. TAYLOR, Tuesdays, Thursdays, and Saturdays, at ten.

*Ophthalmic Surgery.*—MR. POLAND and MR. BADER, Mondays, at a quarter to nine.

*Pathology.*—DR. WILKS, Saturdays, at a quarter to nine.

*Dental Surgery.*—MR. SALTER.

*Comparative Anatomy and Zoology.*—DR. PAVY and DR. MOXON, Tuesdays and Saturdays, at half-past twelve.

*Use of the Microscope.*—MR. DURHAM, Mondays, at half-past twelve.

*Botany.*—MR. JOHNSON, Tuesdays, Thursdays, and Saturdays, at half-past eleven.

*Practical Chemistry.*—Mondays, Wednesdays, and Fridays, ten to one.

*Demonstrations on Operative and Manipulative Surgery.*—MR. BRYANT, Mondays, at three.

*Registrars.*—*Medical*—DR. MOXON ; *Surgical*—MR. DURHAM.

DR. MOXON, MR. BANKART, and DR. HILTON FAGGE, will assist Pupils in their Studies.

THE LIBRARY, MUSEUMS, AND MODEL-ROOMS, ARE OPEN DAILY TO THE STUDENTS, FROM NINE O'CLOCK A.M. TILL FIVE O'CLOCK P.M.

MR. STOCKER, *Apothecary to Guy's Hospital*, is authorised to enter the Names of Students.

# ASTLEY COOPER PRIZE.

---

## The Eighth Triennial Prize of Three Hundred Pounds,

*Under the Will of the late SIR ASTLEY COOPER, Bart.,*

WILL BE AWARDED TO

THE AUTHOR OF THE BEST ESSAY OR TREATISE

### "ON INJURIES OF THE HEAD AND THEIR TREATMENT,"

THE Condition annexed by the Testator is, "That the Essays or "Treatises written for such Prize shall contain original experiments "and observations, which shall not have been previously published ; "and that such Essays or Treatises shall (as far as the subject shall "admit of) be illustrated by preparations and drawings, which pre- "parations and drawings shall be added to the Museum of Guy's "Hospital, and shall, together with the Work itself and the sole and "exclusive interest therein and the copyright thereof, become thence- "forth the property of the Hospital, and be transferred as such by "the successful candidate."

It is the will of the Founder that no Physician, or Surgeon, or other officer for the time being, of Guy's Hospital or of St. Thomas's Hospital, nor any person related by blood or affinity to any such Physician, or Surgeon, or other officer for the time being, shall at any time be entitled to claim the Prize ; but, with the exception here referred to, this (the Astley Cooper) Prize is open for competition to the whole world.

Candidates are informed that their Essays, either written in the English language, or, if in a Foreign Language, accompanied by an English translation, must be sent to Guy's Hospital on or before January 1st, 1865, addressed to the Physicians and Surgeons of Guy's Hospital.

Each Essay or Treatise must be distinguished by a Motto, and be accompanied by a sealed envelope containing the Name and Address of the Writer. None of the envelopes will be opened, except that which accompanies the successful Treatise. The unsuccessful Essays or Treatises, with the illustrative preparations and drawings, will remain at the Museum of Guy's Hospital until claimed by the respective writers or their agents.

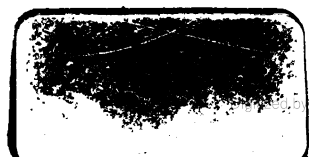












Digitized by Google

